NOLOGY DEPARTMENT
hemical Age. 1 November 1947

WITH METALLURGICAL SECTION

THE CHEMICAL AGE

VOL LVII 1 NOVEMBER 1947 No 1477

PUBLIC LIBRARY
NOV 17 1947
DETROIT

Material consideration...

Raw material for surface coatings? Yes; but which is the material most suited to your requirements? Is that material available? If not, are there any practical substitutes? These and many other questions are readily answered by the Sales Office of BRP. Under the present circumstances the selection of materials calls for the most intimate knowledge of the available range .... Better get in touch with BRP on all questions of material consideration.

Ask BRP about Resins

BRITISH RESIN PRODUCTS LIMITED

Consolidating all plastics sales and manufactures hitherto carried out by: F. A. Hughes & Co., Limited · Indurite Moulding Powders Limited Cellomold Limited · Extruded Plastics Limited · **Sales Office: Abbey House, Baker Street, London, N.W.1.** *Telephone:* **Welbeck 2332/6. Works: Tonbridge · Feltham · Radcliffe · Barry** *(under construction)*

ESTABLISHED 1840

DANKS OF NETHERTON LTD

CHEMICAL PLANT
PRESSURE VESSELS
JACKETTED PANS
MIXERS RECEIVERS

ALL TYPES OF WELDED AND RIVETED STEEL FABRICATIONS

NETHERTON, DUDLEY
WORCS.

LONDON OFFICE—
329, HIGH HOLBORN, LONDON, W.C.1

ACIDS

★NEW BUYERS ESPECIALLY INVITED

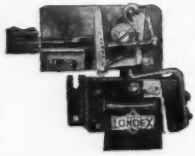
- METAL FINISHING
  NITRIC, HYDROCHLORIC, SULPHURIC, DIPPING ACIDS & SUNDRY CHEMICALS
- PROCESS ENGRAVING
  NITRIC ACID, IRON PERCHLORIDE (LIQUID OR SOLID) SUNDRY CHEMICALS
- GARAGES, ETC.
  ACCUMULATOR ACIDS (ALL STRENGTHS) DISTILLED WATER

GEO. F. BOOME & SON LTD.

STAR CHEMICAL WORKS
WATTS GROVE, BOW, E.3
PHONE EAST 2264-5

LONDEX

RELAYS FOR A.C. AND D.C.



TWO STEP RELAY

LF/FS (Heavy Silver Contacts). First impulse "On," second impulse "Off"

Ask for leaflet 88/CA.

Multi-Contact & MERCURY RELAYS

Measuring Relays Time Delay Relays, Current and Voltage Sensitive Relays, Complete Control Plants.

Ask for leaflet RE/CA.

Mercury Relay, LQA

LONDEX LTD SYDenham 625h-9
MANUFACTURERS OF RELAYS
207 ANERLEY ROAD LONDON S.E.20

PUMPS

FOR ALL PURPOSES

Centrifugal and Diaphragm
1½" to 4" dia.

PETROL, ELECTRIC OR HANDPOWER.

NEW AND RECONDITIONED.
SALE OR HIRE.

RING GREENWICH 3189

THE
GREENWICH PUMP & PLANT CO., LTD.

DENHAM ST., GREENWICH S.E.10

Heavy Chemicals and Pharmaceutical Specialities

SPENCE CHEMICALS are backed by over 100 years of experience. Aluminous compounds are the chief products, but titanium salts, silicas and special pharmaceutical chemicals are also manufactured.

A booklet giving an abridged range of SPENCE chemicals will gladly be sent on request.

PETER SPENCE & SONS LTD

National Buildings, Manchester 3

London · Widnes · Goole · Bristol

R.P 1868A

HYDROGEN PEROXIDE

All grades and concentrations

PEROXYGEN COMPOUNDS, including SODIUM PERCARBONATE · MAGNESIUM PEROXIDE · ZINC PEROXIDE · UREA HYDROGEN PEROXIDE · AMMONIUM, SODIUM AND POTASSIUM PERSULPHATES BENZOYL PEROXIDE

BARIUM COMPOUNDS

SODIUM SULPHIDES · SODIUM ACID PHOSPHATES · SODIUM HYPOCHLORITE METALLIC SOAPS · SULPHATED FATTY ALCOHOLS · SODIUM METASILICATE ALKALINE CLEANERS

Chemicals

INDUSTRIAL AND FINE

CROSSED KEYS BRAND

LAPORTE

B. LAPORTE Ltd. LUTON Phone: LUTON 4390 Grams: Laporte Luton

FULLY OPEN TOP DRUMS

READS' E.H. PATTERN HOOP CLOSURE DRUM

is possibly the simplest effective method of closing and sealing fully Open-top Containers for the transport of Pastes, Powders and certain Liquids. When manufactured from Tinplate and/or internally lacquered it is also suitable for foodstuffs. Rubber or Cotton Rings are used as the gasket and, when necessary, these Drums can be supplied air or liquid-tight.

Available from 7″ to 22″ diameters and up to 42″ in depth. Materials include Mild Steel, Tinplate, Terneplate, Tin-Terne Plate, Aluminium and other non-ferrous materials. 28 BG to 18 BG thicknesses.

In all but the four largest sizes, these Drums can be supplied fully lithographed or printed to specification. The interiors of all sizes can be supplied lacquered, enamelled, or finished with suitable coatings for the appropriate product, or, alternatively, the exteriors and/or interiors can be supplied painted to requirements.

READS

OF LIVERPOOL

MANUFACTURERS OF PLAIN OR PRINTED TINS, CANS, KEGS AND DRUMS

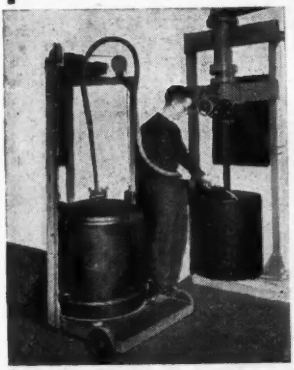
READS LIMITED · ORRELL HOUSE · ORRELL LANE · WALTON · LIVERPOOL 9 · AINTREE 3600
227 GRAND BUILDINGS · TRAFALGAR SQUARE · LONDON · W.C.2 · WHI 5781
ALSO AT LONDON, GLASGOW, BELFAST AND CORK

R3051/1-C1

INDEX TO ADVERTISERS
IN THIS ISSUE

	Page
Air Conditioning (Jeffrey's), Ltd.	iv
Allen, Athole, G., (Stockton), Ltd. ...	vii
Ashmore Benson, Pease & Co., Ltd. ...	xxi
Aygee, Ltd.	xxi
Blackwells Metallurgical Works, Ltd. ...	604
Boome, George, F., & Son, Ltd. ...	...Cover ii
British Resin Products Ltd., The ...	Front Cover
Braby, Frederick, & Co., Ltd.	x
British Steam Specialties, Ltd.	xxii
Callow Rock & Lime Co., Ltd. ...	Cover ii
Classified Advertisements ...	xviii, xix, xx & xxi
Coastwise Petroleum Co., The	xvii
Commercial X-rays, Ltd.	Cover iv
Danks of Netherton Ltd.	...Cover ii
Derbyshire Stone Ltd., ...	612
"Discovery" Jarrold & Sons Ltd. ...	xxii
Dowson & Mason Gas Plant Co., Ltd. ...	xvi
Farnell Carbons Ltd.	xxii
Farwig, J. F., & Co.	xii
Foster Yates & Thom. Ltd., ...	viii
Freeman, William, & Co., Ltd.	xxi
Greenwich Pump & Plant Co., Ltd.	...Cover ii
Hackbridge & Hewittic Electric Co., Ltd., The	vi
Harris, Francis W., & Co., Ltd.	xxii
Hull Development Committee, The ...	xii
Imperial Smelting Co., Ltd.	611
Jenkinson, W. G., Ltd.	612
Johnson, Matthey & Co., Ltd.	xv
Kestner Evaporator & Engineering Co., Ltd.	iii
Kilner, John, & Son, (1927), Ltd.	xxi
Laporte, B., Ltd.	i
Lennox Foundry Co., Ltd.	xxii
Londex, Ltd.	...Cover ii
Lord, John, L., ...	Cover iv
Manlove, Alliott & Co., Ltd.	iv
May & Baker, Ltd.	612
Metallurgical Chemists Ltd.	xxii
Mirvale Chemical Co., Ltd.	Cover iii
Monsanto Chemicals Ltd.	v
Nordac Ltd.	xiv
Pilot Engineers Ltd.	ix
Prodorite Ltd.	Cover iii
Pulsometer Engineering Co., Ltd., The ...	xiv
Reads, Ltd.	ii
Robinson, L., & Co.	x
Sandiacre Screw Co., Ltd.	xvi
Shell Chemicals Ltd.	xiii
Spence, Peter, & Sons Ltd.	i
Swift & Co., Pty. Ltd....	xxii
Widnes Foundry & Engineering Co., Ltd.	xi
Worthington-Simpson, Ltd.	vi
Yorkshire Tar Distillers Ltd.	viii

SAFETY
IN HANDLING CORROSIVE LIQUORS



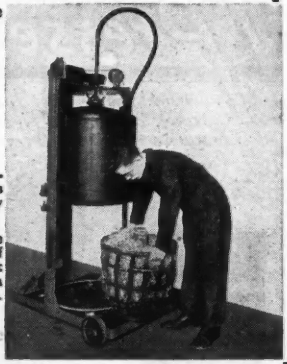
Is a point of law under the new Factory Acts.

The OLDBURY PATENT SAFETY CARBOY DISCHARGER

will empty the contents of any carboy, bottle or vessel and complies with the conditions of the Factory Act, 1937.

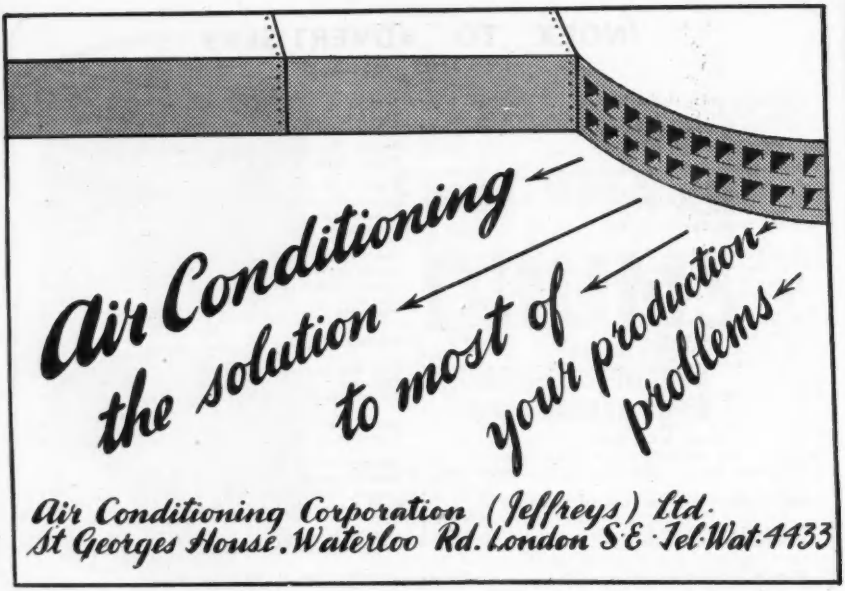
It eliminates all risk of breakage and spilling. Ensures the safety of the operator. It is also the quickest way of elevating the contents of a carboy, etc., up to a height of 40 feet.

Write for Pamphlet



KESTNER'S

Chemical Engineers - 5, Grosvenor Gardens, London, S.W.1


Air Conditioning
the solution
to most of
your production
problems
Air Conditioning Corporation (Jeffreys) Ltd.
St Georges House. Waterloo Rd. London S.E. Tel. Wat. 4433

Filter Presses
For all kinds of Industries
MANLOVE'S
with Plates of Cast Iron, Wood, or Special Metal, to suit varying requirements.
MAKERS OF CENTRIFUGALS, FILM DRYERS, FILTER PRESSES, ROTARY DRYERS, JOHNSTONE DRYERS.
MANLOVE Alliott & CO., ENGINEERS LTD. NOTTINGHAM.
LONDON OFFICE - 41 & 42 Parliament St., Westminster, S.W.1

FOR EVERY INDUSTRY

PHENOL . . . CRESYLIC ACIDS . . . PURE CRESOLS . . .

PHTHALIC ANHYDRIDE . . . BENZOATES . . .

SALICYLATES AND MANY OTHER

PHARMACEUTICALS . . . FLAVOURINGS . . .

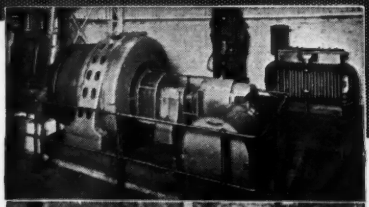
PRESERVATIVES . . . GERMICIDES . . . ANTISEPTICS . . .

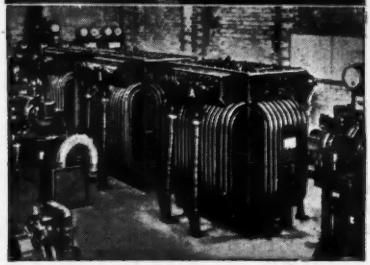
RUBBER CHEMICALS . . . DYE-STUFF INTERMEDIATES.

Unfortunately many of the above products are, temporarily, in short supply. In the meantime, however, we welcome your enquiries and will be glad to give you full information on present and future availability.

MONSANTO CHEMICALS LIMITED • LONDON SW1

HACKBRIDGE TRANSFORMERS *for* INDUSTRIAL POWER SUPPLY



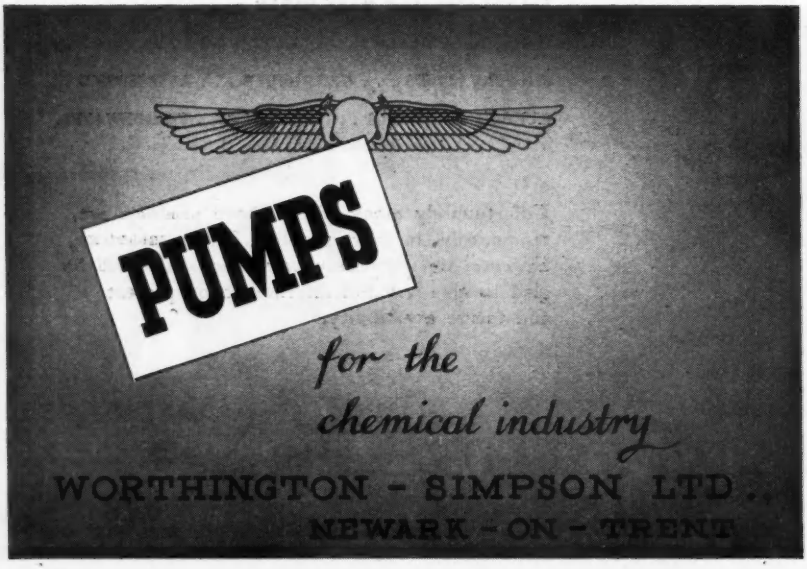


RELIABILITY of electrical supply is especially vital in industries where continuity of process is of high importance.

TRANSFORMERS, whether for general distribution of power to the works or for supplying individual equipment, e.g., furnaces and heat treatment plant, should accordingly be the best available—which means HACKBRIDGE transformers.

The illustrations show :—
(Above) Hackbridge transformer supplying a compressor (By courtesy, Messrs. Rubery Owen Ltd.)
(Below) Hackbridge transformer installed in a works sub-station.

HACKBRIDGE AND HEWITTIC ELECTRIC CO. LTD.
WALTON-ON-THAMES, SURREY
Telephone : Walton-on-Thames 760
Telegrams : "Electric, Walton-on-Thames"



ATHOLE G. ALLEN (Stockton) LTD.

STOCKTON-ON-TEES,

CO. DURHAM

Telephone :
STOCKTON 6375 (3 lines)

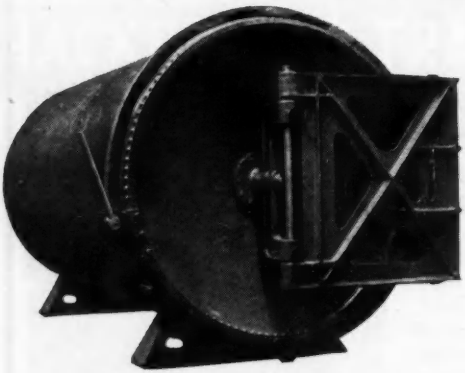
Telegrams :
Chemicals, Stockton-on-Tees

DI - NITRO - TOLUENE

ORTHO - NITRO - TOLUENE

ORTHO - TOLUIDINE

NON-MEMBERS OF TRADE ASSOCIATIONS.



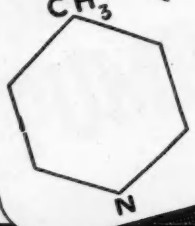
IMPREGNATING VESSEL FOR PRESSURE OR VACUUM
'F.Y.T.' SELF-SEALING QUICK ACTING BOLTLESS DOOR

HYDRAULIC EQUIPMENT
HYDRAULIC & POWER PRESSES
CHEMICAL PLANT
RUBBER MACHINERY
WELDED FABRICATION WORK
CLASS "A" PRESSURE VESSELS
SHELL TYPE BOILERS
STEAM RAISING EQUIPMENT

FOSTER YATES & THOM LTD
Heavy Precision Engineers
BLACKBURN ENGLAND

ABSIT INVIDIA

Y. PICOLINE
(4. METHYL PYRIDINE)



B.Pt. 760 mm. 145·5°c
Sp. Gr. 15·5°c 0·959

Available in commercial quantities.

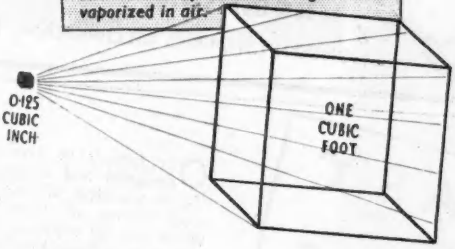
YORKSHIRE TAR DISTILLERS LTD
CLECKHEATON, YORKS.
TEL. CLECKHEATON 790 (5 LINES)
TELEGRAMS TO-YOTAR CLECKHEATON

Inflammable

GASES & VAPOURS ENDANGER LIFE & EQUIPMENT

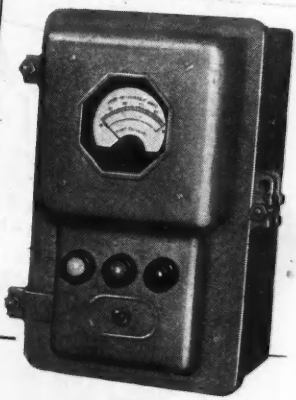
THE PROBLEM

Rapid detection of inflammable vapour or gas in air before a concentration can reach the danger-limit, bearing in mind that the vaporization of 0.125 cu. in. of inflammable liquid converts the air in a 1 cu. ft. container into an explosive gas; which means that inflammable liquid will produce almost 14,000 times its own volume of combustible gas when vaporized in air.



THE ANSWER

The POOLE Automatic Combustible Gas Alarm can, if necessary, be set to operate when the concentration by volume of inflammable liquid in air reaches as little as four parts in one million.



PILOT ENGINEERS LTD.

5 GORDON SQ., W.C.1

WORKS: STOCKPORT, CHESHIRE

FOR INDUSTRIAL ECONOMY AND SAFETY IN PETROLEUM INSTALLATIONS, SOLVENT PROCESS AND RECOVERY PLANTS, ETC. 'POOLE' COMBUSTIBLE GAS ALARMS AND CONTROLS.

Jubilee

PATENTED WORM DRIVE

Clip

The Original and **Still the Best**

● Used Extensively Throughout the Chemical Industry

L. ROBINSON, & CO.

6, LONDON CHAMBERS **GILLINGHAM, KENT**

'BRABY' (REGD.)

Steel DRUMS

SINGLE TRIPPER AND RETURNABLE TYPES

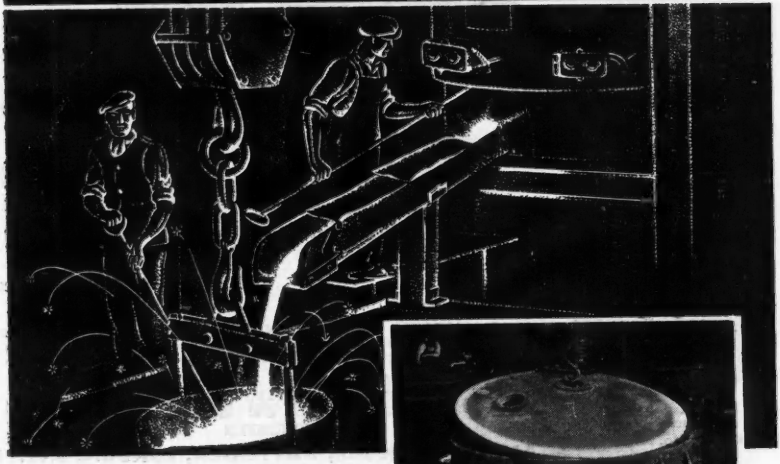
Our factory at Liverpool is designed and equipped for the production of high grade steel drums of many types, which can be supplied Painted, Galvanized, Tinned or Lacquer lined.

Certain types can also be made from Stainless Steel.

FREDK. BRABY & CO. LTD.,

LIVERPOOL : Havelock Works, Aintree, Liverpool 10. Tel.: Aintree 1721.
LONDON : Head Office, Fitzroy Works, 352-364 Euston Road, N.W.1. Tel.: Euston 3456.
EXPORT : 110 Cannon Street, London, E.C.4. Tel: Mansion House 6034.
Also at
DEPTFORD - GLASGOW - BRISTOL
BELFAST and PLYMOUTH

FOR SPECIALISED CASTINGS



The photograph reproduced above shows a cast-iron caustic pot and cover for shipment to Sweden. Dimensions: Pot, 7 ft. 10½ in. inside diameter by 9 ft. 1½ in. overall depth; weight, 9½ tons; cover, 7 ft. 10½ in. diameter, weight, 23 cwts.

High standards, backed up by close supervision over all materials and workmanship assure the unvarying good quality of Widnes Castings. Widnes Foundry have the facilities, the men and the experience to produce the most intricate and accurate special-purpose castings —and this combination is at your service from the moment you get in touch.

★ **WIDNES FOUNDRY are specialists** in the production of cast and fabricated vessels and equipment in cast irons, mild and stainless steels for the **CHEMICAL, OIL, FOOD and ALLIED INDUSTRIES.**

WIDNES FOUNDRY & ENGINEERING

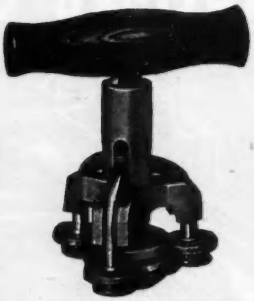
Telephone Widnes 2251 (4 lines) **CO. LTD** Telegrams 'Foundry' Widnes

LUGSDALE ROAD - WIDNES - LANCS

London Office: BRETTENHAM HOUSE, LANCASTER PLACE, STRAND, W.C.2

Tins for all Trades Home & Export

Square can showing patent screw neck. **Patent No. 382,380**



CAPSULING MACHINE
Patent No. 10699

NECK, PLUGS and CAPSULES for hermetically sealing cans holding liquids.

SPECIALISTS IN PRESS FITTINGS for all types of Cans and Drums
Contractors to the Admiralty, Ministry of Supply, India Office, Crown Agents for the Colonies etc., etc.

J. F. Farwiq & Co
LIMITED Est. 1809

208-214 YORK RD., BATTERSEA, LONDON, S.W.11
Grams: CALORIGEN, BATT, LONDON. Tel: Battersea 7008

HULL
BRITAIN'S CHEAPEST PORT

Offers Every Facility for *New* INDUSTRIES

Enquiries invited for sites for these new chemical industries:—

Adhesives
Artificial fibres
Candles
Carbon, active
Cellulose products
Cosmetics
Dextrin
Glucose
Gums
Insulating materials
Leather goods . . artificial
Lime products
Mineral oil refining
Oils—edible, technical and medicinal
Ore refining
Pigments
Plastics
Resins, synthetic
Safety glass
Toilet preparations
Vitamin foods
Waterproofing materials
Wood distillation products

The above are industries for which raw materials are normally available at the Port of Hull or can be supplied by existing industries.

Write in confidence to - THE TOWN CLERK · HULL

Chemicals from Petroleum

DUTREX 55

The present shortages of essential raw materials have led to a quickening interest in products which are able to replace—wholly or partly—those in short supply. The petroleum-derived DUTREX 55 has many properties of value to chemical industry. DUTREX 55 is a brown oil, soluble in most organic solvents, and compatible with many oils, gums and resins. It possesses marked water repellent and alkali resisting properties and has proved to be a useful plasticiser. DUTREX 55 has been employed satisfactorily in the paint, plastics, textile and engineering industries as a partial replacement for drying oils and as a plasticiser for oil-soluble urea-formaldehyde resins and drying and non-drying alkyds. DUTREX 55 improves the adhesion of highly polymerised vinyl resins in leathercloth manufacture and has been adopted in many formulations for adhesives, mastics and belt dressing compounds. Concrete hardening and water proofing, brake linings, core oils, printing ink, linoleum, paper sizing—all offer scope for DUREX 55 and indicate the ubiquitous nature of this material.

Advantages of DUTREX 55

- Drying properties in the presence of driers.
- Compatible with many oils, gums and resins.
- Water repellent, acid and alkali resisting properties.
- Useful plasticiser, particularly for highly polymerised vinyl resins.
- Low cost.
- Adequate supplies available in bulk, free of restrictions.

Full information and technical service obtainable on request.

SHELL CHEMICALS LIMITED
(DISTRIBUTORS)

SHELL

HEAD OFFICE: 112, STRAND, LONDON, W.C.2
Also at: 4, St. Mary's Parsonage, Manchester, 3 · Blackfriars 0097

"DUTREX" is the registered Trade Mark of Shell Chemicals Limited

Pulsometer Pumps

ALL DUTIES
For
Food and
Chemical
Industries
and
Processes

LIST No. 3086

Rotary or Reciprocating
VACUUM PUMPS
for
Factory or Laboratory
All Sizes & Types
for
High Vacua
Displacement
Dessication
Distillation
Moist Air
Circuits
Illustrated is our 8/10" Single Stage Rotary Vacuum Pump
PULSOMETER-DOULTON STONEWARE PUMP
Acid - Proof
Non-Porous
Will handle most hot or cold corrosive liquids without injury to the pump. Free from gland trouble.
CENTRIFUGAL PUMPS
made of
Stoneware and Special Metals
In all sizes for Food and Chemical Industries and Processes.
Special Metal Pumps are made of special corrosion resisting materials adapted to the particular chemical required to be pumped.

Pulsometer Engineering C° Ltd.
Nine Elms Ironworks, Reading

"NORDAC"
REGD.
SOFT RUBBER LINING OF OLD OR NEW TANKS AT OUR WORKS OR ON SITE

"VULCOFERRAN"
REGD.
SPECIAL EBONITE LINING FOR HIGH TEMPERATURE WORK

DESIGN AND CONSTRUCTION OF SPECIAL PURPOSE PLANT A SPECIALITY

NORDAC LIMITED
DUKES ROAD,
WESTERN AVENUE,
LONDON, W.3. Phone : ACORN 2289

The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

BOUVERIE HOUSE, 154 FLEET STREET, LONDON, E.C.4

Telegrams: ALLANGAS FLEET LONDON — Telephone: CENTRAL 3212 (16 lines)

SCOTTISH OFFICE: 116 Hope Street, Glasgow (Central 3970)

MIDLANDS OFFICE: Daimler House, Paradise Street, Birmingham (Midland 0784-5)

THE CHEMICAL AGE offices are closed on Saturdays in accordance with the adoption of the five-day week by Benn Brothers Limited

VOL. LVII No. 1477. — 1 November 1947 — Annual Subscription, 26s. 8d. per copy; post free, 10d.

Science and the Humanities

IN this materialistic age, the study of Greek and Latin, of the gifts of old civilisations long past and the mellow works of our great ancestors is regarded as of small account. There is meanwhile a deal of discussion about education for industry, since the majority of our people are engaged in industry and commerce. On all sides we hear of a shortage of skilled technical men, and an employer asks only to be provided with " bodies "—to use a singularly soulless army term—who shall have assimilated sufficient facts to be granted a degree in some science or branch of technology, and who will then devote that knowledge to industry. There is no demand for *education;* there is an overwhelming demand for *training.* Some educationalists take a broader view, but their voices may be drowned by the clamour for technicians.

Let us admit at once that an education based wholly on the classics is of small use in industry. He who would make his mark, or even earn a competence, must have been trained to a trade or profession. It is the generation of the specialist. The specialist, however, is something of an unbalanced entity. A great deal of the contemporary unrest in the country derives from an unbalanced, materialistic, Marxist attitude on the part of those who should know better. Balance, we believe, can be found only by leavening our essential practical training with a classical education.

Lord Greene, Master of the Rolls, a Hertford scholar who has been Principal of a Working Man's College, has pointed out the dangers of the doctrine being preached that the main, perhaps the only, object of education is to turn a man into a good servant of the State. That is how Nazism functioned in Germany.

In the light of the obvious discontents among the best of our population, Lord Greene pins his faith to the humanities: " In a world where material needs, not of a few but of the whole nation, must necessarily come first—a world in which specialisation and the expert . . . are regarded as providing the only means of salvation for our people—the humanities in education are to be regarded as an indispensable corrective of ill-balance."

If we accept the need for a balanced education, as accept it we must, the question arises how are we to attain the ideal? If it takes eleven years to train a chemical engineer, can he be expected also to be a classical scholar? The question is apposite, but Lord Greene has the answer. Foreseeing that classical learning and scholarship must become the speciality of a devoted few, Lord Greene has come to the conclusion that " the classics, the humanities in the widest sense, and science itself might unite in a determination to provide those elements of a liberal education." He suggests that there should be attached to every school a " humanities master " who should impart the values of the classics and " endeavour to implant in the minds and tastes of his pupils those qualities which the humanities alone can give. . . . His function would be to teach not the classics, but the humanities."

We have been warned; and there is yet time, even for those of us who have qualified without that liberal background, which reading can still provide.

NOTES AND COMMENTS

"Export Only"

IN sharpening the focus of attention upon "exports at all costs," Sir Stafford Cripps, in his most recent national appeal, would seem to have overlooked some vital considerations which we cannot afford to neglect, if we are to survive as an industrial nation. That belief is strengthened by the timely note issued by the Association of British Chemical Manufacturers, reproduced on another page, indicating that there are signs that a too literal interpretation of Sir Stafford's demand that "We must increase exports at whatever cost to the home market" may, in the long run, have results the reverse of what was intended. If "Is it for export?" becomes the indiscriminate touchstone for regulating all supplies to the factories and chemical plants, some of those undertakings will one day be derelict, their potential contribution to the export drive lost and the commercial channels upon which fundamentally all productive industry rests may disintegrate beyond repair. The knowledge then that a proportion of export undertakings have stockpiles fuller than their order books and unlimited supplies of raw materials will be meagre consolation.

German Dismantling

THE new dismantling list for the Anglo-U.S. zone of Germany contains more than 60 chemical factories, but most of these are concerned entirely with the production of explosives and other war chemicals. Dynamit A.G., for instance, is represented with eight factories on the dismantling list (not counting works for the production of ammunition, fuses, etc.), but most of these concentrated entirely on making explosives. Two other Dynamit factories only are on the list: the works at Troisdorf for making nitrogen, Vulcan fibre, celluloid and phenol resins, and the works at Schlebusch for glycerine and T.N.T. These plants, of course, have been selected for their war potential, and the same consideration is responsible for the inclusion of other chemical plants in the dismantling list. Eleven I. G. Farbenindustrie works are mentioned but certain parts only of these will be dismantled. They include the Perlon U plant at Dormagen, the works for cellulose derivatives and various plastics at Elberfeld, the plant for ethyl oxide and ethyl dichloride at Holten, the works for sulfigran, atebrin, various synthetic resins, hydrazine hydrate, activated carbon and toluene nitrate at Leverkusen, for electrolytic chlorine, caustic soda and alkyd resins at Uerdingen, for ethyl oxide, ethyl dichloride, poly-ethylene, and bleaching powder at Zweckel, for liquid oxygen for industrial purposes at Duisburg, the plant for making wax at Gertshofen, the departments for uresin, acetate, carboresin, black sulphur, sulphur, solvents, chlorine solutions, and dinitrobenzene at Hoechst, and the industrial gas plants at Griesheim and Kassel-Mittelfeld.

Keywar Plants

THE G.m.b.H. zus Verwertung chemischer Erzeugnisse is another company represented with a number of factories on the dismantling list; the six works in question were all used for the production of explosives, smokeless powder, nitro-cellulose, and war chemicals. Schickert, Otte & Co. lose two plants for making 85 per cent hydrogen peroxide at Rhum-springe and Bad Lauterberg, and the hydrogen peroxide plant of Elektrochemische Werke, Munich, is also to be dismantled. Several important soap and glycerine factories are on the list in the British and in the U.S. zones, including part of the Henkel & Co. factory at Duesseldorf, the works of Kopp & Co. in Munich, of M. Kappus at Offenbach, of P. S. Mobs at Giessen, of Rochm & Haas at Darmstadt, and of Kraemer & Flemer at Heilbronn. Other chemical works to be dismantled in the Anglo-U.S. zone are: A.G. für Stickstoffduenger, Knappsack (department for making activated carbon and acetone), Oxo-G.m.b.H., Oberhausen (installations for making alcohol preparations), Chemische Werke Harz-Weser, Langelsheim (activated carbon), Anorgana A.G., Gendorf (departments for chlorine and caustic soda, for acetaldehyde, and for glycol), Dr. Alexander Wacker, Burghausen (departments for cellulose acetate resins and for solvents) Chemische Werke V. Bransche & Co., Gersthofen (hydrazine hydrate), Vereinigte Flusspatwerke, Stulln (works for the production of hydrofluoric acid, sodium hydrofluorides, synthetic cryolite, potassium bi-

On Other Pages

Leader:
Science and the Humanities ... 587
Notes and Comments:
Export Only 588
German Dismantling 588
Key War Plants 588
Lesser Evil 589
A.B.C.M. Warning 590
Export Sales Slump 590
Record Chemical Exports 591
Quest for Economic Security .. 592
Royal Institute of Chemistry ... 593
Sulphuric Acid from Sludge ... 593
American Chemical Notebook ... 594
Luminescent Pigments 595
Phenol Recovery 595
Principles of Pressure Spray Nozzles—II 596
Baird and Tatlock Sales Convention 605
Zirconium Oxide 605
Personal 606
METALLURGICAL SECTION
Fluoroscope as Flaw Detector ... 599
Iron Sulphate Recovery 601
Improved Gas Purification 601
Korea's Chemical Industry 601
Principles of Die-Casting 602
Tin as Anti-Corrosive 603

fluoride, and sodium silicate), Kalle & Co., A.G., Wiesbaden (installations for making methyl, ethyl and cellulose products), Chemische Werke Kurt Albert, Wiesbaden (departments for phenol plastics and copal resins), Saline Ludwigshall, Bad Wimpfen (sulphur salts, aluminium sulphide, and synthetic cryolite), and Mahler, Esslingen (chemicals).

Lesser Evil

THE dismantling of plant for the manufacture of chemicals chiefly used for war purposes which are also of peacetime use will inevitably involve the German chemical industry in certain difficulties, but these seem to be less troublesome than the shortage of coal and electricity and the obstacles to a smooth flow of production raised by zonal boundaries. During the first half of this year chemicals accounted for 22 per cent of all shipments from the western to the eastern zone and for 12 per cent of all consignments in the opposite direction. They were thus the principal item in inter-zonal trade, more important even than coal and steel. This is largely due to the fact that the production of raw materials for synthetic plastics, fibres, rubber substitutes, and fuel components which played such an important part in German war production of chemicals was geographically tied down to the availability of basic materials and power. The zonal frontiers have cut some important chemical plants from their original power and raw materials sources, quite apart from the fact that the supply of coke, coal-tar and other organic raw materials has been severely reduced by the shortage of coal. For thermo-plastic resins, for instance, the Anglo-U.S. zone in consequence now depends on one small plant in Bavaria whose output is less than 10 per cent of the wartime supply in the combined zone. It is argued that the production of synthetic fatty acids, lubricants, rubber and leather substitutes, and fibres could be substantially increased and meet a much larger part of the domestic demand than at present if their raw material intake could be increased. But the problem of raw materials is not the only one. Prolonged idleness has led to the dispersal of labour and deterioration of the technical installations. The recent increase in Ruhr coal production is likely to help to increase chemical production, but the latest output statistics still show big fluctuations and differences between different regions and factories, due to irregular arrivals of fuel and interruptions caused by power cuts and other difficulties.

New Formaldehyde Factory

At least eighteen months will pass before the disused tin-plate works at Mold can be converted for use by a new light industry. This news was given to Mold Urban Council, by Messrs. Synthite, Ltd., who bought the works as a branch factory for producing formaldehyde. Large quantities of water, it was said, were required for cooling purposes, and it has been found that the supply from the River Alyn will often be insufficient. The project now depends on the success of a bore-hole, and results are awaited before proceeding further. Even with a satisfactory water supply, considerable repairs and reconstruction will be necessary before the plant can be installed. A certain amount of local labour will be required for the preparatory work.

A.B.C.M. Warning

Need for Home-Export Balance

BECAUSE of the present overwhelming emphasis on exports, there is a prospect that the essential needs of home manufacturing industries, notably the chemical industry, may be under-supplied, through the misinterpretation of Board of Trade policy on the balance of home and export allocations.

This dangerous trend is the subject of a timely warning contained in the following statement issued by the Association of British Chemical Manufacturers:

Exports First

In his address, at the Central Hall, Westminster, on September 12, on the export drive, to which great publicity was given in the *Board of Trade Journal* and in the Press of the country generally, the then President of the Board of Trade, Sir Stafford Cripps, made the general statement that the first call on industry was to reach its export targets and that what was left after that would be for the home market.

Guidance Needed

Firms not only in the chemical industry but in other industries, apparently in a desire to implement the President's desires and instructions, are now, in many cases, demanding to know whether materials and plant required by firms in the chemical industry are to be used for export and if so, to what extent. This is likely to lead to very serious difficulties unless industry generally is made aware of the later statement by the new President of the Board of Trade, Mr. Harold Wilson, to the effect that the chemical industry is in a special position and that its first duty, speaking generally, is to supply other industries which have been given export targets and the essential needs of the home market, such as those for agriculture and public health, and that what remains after that will be what is available for the export market.

Vital Chemical Plant

In other words, the export criterion mentioned by Sir Stafford Cripps does not operate for raw materials and equipment supplied to firms in the chemical industry as it does to firms in other industries. There are indications that Regional Boards are not entirely appreciative of this distinction, which has also been emphasised by Mr. John Wilmot, the Minister of Supply, when he addressed the Engineering Advisory Council. He made it clear that in the case of certain types of machinery, which included chemical plant, home supplies of which would indirectly make an early and significant contribution to export in the hands of the chemical industry—itself a most important export industry—the country would have to be particularly careful to find the correct balance between home and export.

Chemical Industry Essential

The recent order in regard to the direction of labour may also give rise to misunderstanding, because the chemical industry is not mentioned in it. The purpose of the order was to draw attention to the essential industries which, in general, are seriously under-manned and was not intended to indicate all the industries of the country which are regarded as essential at the present time. The chemical industry is most certainly regarded by the Government as an essential industry, but in general its labour shortage is not great. Unless, however, the position is fully appreciated there is a danger that the Labour Exchanges will direct workers to industries

(*Continued in next column*)

other than the chemical industry, with the result that the industry will be unable to make up its wastage of labour and the deficiencies which already exist and will increase as fresh plant and equipment become available.

It is essential that the Government departments and British industry should have a clear appreciation of the above points and their implications.

Export Sales Slump

Copper Sulphate Trade Halved

CHANGING conditions in the export markets which had greatly diminished sales from this country were referred to by the chairman, Mr. J. D. McKechnie, at the 23rd annual general meeting of the British Suphate of Copper Association, Ltd., in London last week. Sales of sulphate of copper, about 90 per cent of which was for export, had been very unsatisfactory, he said. Exports, which in 1945-46 amounted to 52,698 tons were reduced in 1946-47 to 30,103 tons, representing a difference in value of approximately £750,000.

Foreign Plants Starting

The carry-forward of stocks of sulphate of copper shipped by UNRRA to European countries, the restarting of foreign sulphate of copper plants provided with relief copper, and currency difficulties have hindered our sales to European countries.

The association had kept in close touch with the Government and had constantly reminded them that while this country would not consider bi-lateral trading agreements, other countries were busy making such agreements, which would seriously interfere with our exports of sulphate of copper.

Bi-Lateral Trading

Although the outlook for the 1947-48 season was not promising, some hope could be derived from the fact that the Government had now decided that bi-lateral trading agreements may be necessary in order to assist exports, and that the Board of Trade had promised assistance.

More Fats for U.K.

The International Emergency Food Council last week made its recommendations for the 1947 allocations of fats and oils. Under these arrangements, Britain is to receive one of the largest shares. Thirty exporting nations will provide 3,473,000 tons—900,000 tons more than last year's actual shipments—for distribution among 60 importing nations. European nations will, in particular, benefit from the increased quantities now available.

Record Chemical Exports

£788,000 Rise in September

CHEMICALS and associated products contributed materially to the increased U.K. export total in September and the reduction of £18.5 million in the unfavourable balance of trade, which was briefly announced in last week's CHEMICAL AGE. The total overseas sales of chemicals, valued at £3.458 million, represents a record and compares with £2.670 million a year ago. An even greater increase would undoubtedly have been recorded were sodium compounds not still suffering from the limitations imposed by the fuel shortage earlier in the year. Their total is still only half what it was a year ago. In the record of imports there was also a fairly wide tendency to expand, exemplified by items such as caustic and lyes (from 488 to 3858 cwt.), potassium compounds and carbon blacks, of which the last imports were quadrupled in September at 107,000 cwt.

CHEMICAL EXPORTS

	Sept., 1947	Sept., 1946
	Cwt.	Cwt.
Citric acid	241	1,355
Formic acid	1,836	1,660
Tartaric acid	234	366
	Tons	Tons
Aluminium oxide	1,010	6
Sulphate of alumina	2,269	1,248
All other kinds	355	362
Ammonium sulphate	35,267	25,462
Nitrate	5,232	963
	Cwt.	Cwt.
Bleaching powder	43,457	77,640
Calcium carbide	6,119	11,543
	Gal.	Gal.
Benzol	9,198	66,939
Cresylic acid	200,397	196,083
Tar oils	1,172,900	235,258
	Tons	Tons
Copper sulphate	946	1,131
	Cwt.	Cwt.
Disinfectants, etc.	87,996	61,890
Glycerine	343	9,057
Lead acetate, litharge, red lead, etc.	3,402	4,219
	Gal.	Gal.
Tetraethyl lead	83,863	—
	Cwt.	Cwt.
Nickel salts	2,479	2,731
Potassium compounds	4,980	4,986
	Tons	Tons
Salt	13,210	11,360
	Cwt.	Cwt.
Sodium carbonate	243,320	347,264
Caustic soda	97,459	210,297
Chromate and bichromate	—	1,362
Silicate (waterglass)	4,378	22,424
Sodium sulphate and salt cake	16,026	33,151
	Oz.	Oz.
Quinine and its salts	182,001	125,795
	Mega Units	Mega Units
Penicillin	172,042	(Aug. 168,536)
Coal-tar dyestuffs	18,028	13,509
Extracts for tanning	8,446	14,590
Earth colours	15,993	17,209
Lithopone	5,496	4,149
White lead	1,383	848
Paraffin wax	3,093	41
***Total value of chemical manufactures (excluding drugs and dyes)**	£3,458,414	£2,670,536

CHEMICAL IMPORTS

	Sept., 1947	Sept., 1946
	Cwt.	Cwt.
Acetic acid	9,886	—
Boric acid	4,500	—
Tartaric acid	700	1,400
All other kinds of acid	1,364	1,010
	Tons	Tons
Ammonium phosphate	—	893
Borax	36,600	7,000
Calcium carbide	393	4
Glycerine	155	5
	Lb.	Lb.
Iodine	—	59,571
	Cwt.	Cwt.
Caustic and lyes	3,858	488
Potassium chloride	576,881	165,900
Potassium sulphate	38,340	1,100
All other potassium compounds	2,963	2,350
Sodium nitrate	—	60,136
	Pf. Gal.	Pf. Gal.
Ethyl alcohol	528,478	—
	Oz.	Oz.
Quinine and its salts	119,931	—
	Lb.	Lb.
Menthol	14,884	28,172
	Cwt.	Cwt.
Synthetic organic dyestuffs	1,100	302
Carbon blacks	106,415	25,512
Turpentine	11,262	2,184
Paraffin wax	102,896	32,495
***Total value of chemicals, drugs, dyes and colours**	£ 2,243,137	£ 981,673
***Oils, fats and resins**	10,676,396	7,172,629

** Including some commodities not listed here.*

CHEMICAL MANUFACTURERS FINED

Messrs. Stotherts, Ltd., manufacturing chemists, Atherton, Lancs., were summoned at Leigh Magistrates' Court last week for contravening section 47 (2) of the Factories Act, 1947, in that they caused a stationary internal combustion engine to be used at the factory otherwise than in accordance with the provisions of the Act.

The firm had failed to make provision for the gases from the engine emerging into the open air, and for the engine to be partitioned off to prevent fumes entering rooms where people were working. Seven workpeople in the factory had recently been affected by fumes. They were fined £5.

Quest for Economic Security

Are Chemists Adequately Protected?

AT a meeting of the Manchester Section of the British Association of Chemists held at the Engineers' Club, Albert Square, on October 15, Mr. Norman Sheldon, president of the association, opened a discussion on "Economic Security in the Chemical Profession." The chair was taken by Mr. J. Greenwood, F.R.I.C. Members of other scientific societies were also present and a frank and interesting discussion followed.

Mr. Sheldon began by pointing out that there are in existence organisations to which every chemist should belong, but so many do not join because they do not take the trouble to understand what they are trying to do. They grudge the money for the subscriptions—or they think the particular bodies are playing at politics—or they pride themselves on their individuality and ability to look after themselves, he said. This is the kind of pride that very often goes before a fall. In the long run they and the whole profession are the losers.

A National Body

Mr. Sheldon thought that what was needed first of all was a strong professional association of the highest standing which would only admit as full members those who were fully qualified. That should be the national organisation charged with the duty of ensuring that the courses of training in various parts of the country should produce a steady flow of entrants into the various branches of the profession. Every student of chemistry at a university or technical college who intended to take a full course in chemistry should register as a student at a nominal cost; and such registration should be compulsory.

This association, said Mr. Sheldon, should be supreme in all professional matters and if at any time there is compulsory registration of chemists who are allowed to practice, this should be the registering body.

"We all know," he added, "that we have such an organisation in the Royal Institute of Chemistry, an institution to which I have always been proud to belong, for I joined as a student in 1908 because I was told by the chemist responsible for my training that I must pay my 5s. and register. I can assure you I have never regretted that advice."

Referring to restrictive trade practices, Mr. Sheldon said the professional classes were being squeezed more and more between the millstones of taxation and manual workers' privileges. It must be obvious that by their trade union activities certain groups of people were feathering the nests of their members at the expense of the community. Restrictive practices which did not make sense at all to a scientist were encouraged to a far greater extent by trade unions than any employers' organisation ever dreamt of.

The speaker thought that within the next few years almost every profession, medical, accountancy, law and so on, would have to organise its own union to deal with economic matters on non-political lines. Too many of their members who were formerly in private practice were becoming employees of the state or of big industrial firms. They would form unions which every member would be encouraged to join; indeed it would be found almost impossible to stay outside.

After Mr. Sheldon had discussed at some length such questions as unemployment and sickness in the chemistry profession, a general discussion was opened by Mr. Gartside, who said that he was a pharmaceutical chemist engaged in industry. He said that there were a considerable number of pharmacists with high qualifications and considerable industrial experience who were not catered for by the Royal Institute of Chemistry, and if this continued there would be no place for them in the scheme suggested by Mr. Sheldon. He thought that the scope of the institute should be broadened. Mr. Gartside also suggested that the B.A.C. should make it clear that in addition to the individual benefits offered to chemists they desired to mobilise the strength of the profession in order to create social benefits for the community.

No T.U.C. Affiliation

Mr. Maclaren doubted whether it was necessary to have two separate bodies as he thought the Royal Institute of Chemistry could carry on all the work which the B.A.C. does as a trade union, and Mr. Dickinson asked whether it was suggested that the "closed shop" principle should apply, as Mr. Sheldon had mentioned compulsory registration of students. In reply to these two speakers, Mr. Sheldon said that in his experience there were many things that could be done by a trade union that could never be undertaken by a properly constituted professional body. The law allows a trade union to take action which might be very difficult and even dangerous for any body not registered as a trade union.

Mr. Tee asked why the B.A.C. was not affiliated to the T.U.C., and Mr. Sheldon pointed out that the reason was a very simple one, the members had voted against it. He reminded the meeting that affiliation to the T.U.C. was certain to label any organisation as having a definite party bias and for this reason, if for no other, he thought it would be dangerous to affiliate.

SULPHURIC ACID FROM SLUDGE

THE Standard Oil Development Co. claim—in Eng. Pats. Nos. 21678-9/47—an improved method for recovery of sulphuric acid from acid sludge.

Methods hitherto used have included hydrolysis of the sludge with water and steam in order to separate it into oil and weak acid and concentration of the acid. Another current method is to heat the sludge to about 550°F. to cause it to decompose into sulphur dioxide, solid coke, water vapour and small amounts of hydrocarbon vapour. The dioxide, after separation, can be readily converted into pure acid of any desired strength. The latter method, however, requires very large quantities of coke and it has been found difficult to maintain a uniform temperature.

Incandescent Coke

The object of the present invention is to regulate temperature and sludge decomposition, as well as general operation. Powdered coke, heated to incandescence, is passed through a pipe into a reaction vessel, with sufficient inert or non-oxidising gas—nitrogen, carbon dioxide, or flue gas—to cause the coke to behave like a liquid. It passes through a grate in the lower part of a cylinder in the reaction vessel. Sludge is introduced into this cylinder and thoroughly mixed with the coke at a controlled temperature of about 550°F.

Decomposition of Mixture

The mixture passing upward through the cylinder decomposes at the stated temperature into sulphur dioxide, steam, and mixture of hydrocarbon and coke. These are removed, after passing through a rotary separator. The coke may be passed again into process and the dioxide and other products are cooled to separate steam and condense out some of the hydrocarbons. The residual dioxide is passed through a furnace, where the fixed hydrocarbons are burnt out, and then used for production of sulphuric acid.

Turbulent Phase

During the process the coke must be maintained in a suspended dense turbulent phase. Portions are continuously removed, and some is introduced into a separate combustion zone, together with an oxidising gas passing upwards through the solids at a rate sufficient to maintain the dense turbulent condition. Part of the coke is consumed in the combustion zone so that a quantiy of hot, finely divided coke is produced, some of which is removed from the combustion zone to the coking zone.

ROYAL INSTITUTE OF CHEMISTRY

THE Royal Institute of Chemistry of Great Britain and Ireland announce that the following were successful in the September examinations for Associateship or Fellowship of the Institution.

Associateship in General Chemistry

Robert Ballantyne Adamson, Heriot-Watt College, Edinburgh, and Royal Technical College, Glasgow; Geoffrey Robert Andrews, Central Technical College, Birmingham; Desmond Arthur Boswall, Municipal College, Portsmouth; James Wennington Boyd, Technical College, Sunderland; George Alfred Butcher, Central Technical College, Birmingham; Arthur Cecil Diggins, Municipal College, Burnley; William Douglas Fordham, B.Sc. (Lond.), University College, Leicester; William Charles Garratt, Technical College, Derby; Michael Lister Hall, B.Sc.(Lond.), Municipal Technical College, Hull; Samuel Harrison, City Technical College, Liverpool; Frank Reid Harvey, B.Sc. (Lond.), Municipal Technical College, Bolton; John Edwin Hogan, Technical College, Coventry; Crosby Walker Humphrey, Technical College, Sunderland, Ronald Johnson, City Technical College, Liverpool; Alan Gibson Long, Acton Technical College and The Polytechnic, Regent Street, London; Leonard Lowes, Constantine Technical College, Middlesbrough; Robert Pattison Marshall, Technical College, Chesterfield; Alexander McDonald McConnell, Royal Technical College, Glasgow; Edmund Peter Mills, B.Sc. (Lond.), Technical College, Coventry; Dennis Clifford Nicholson, Northern Polytechnic, London; Ronald James Powell, City Technical College, Liverpool; John Roy Prescott, Technical College, Coventry; Raymond Thompson, North Staffordshire Technical College, Stoke-on-Trent, and University College, Nottingham; David John Waters, Technical College, Coventry; Albert William White, B.Sc. (Lond.), Royal Technical College, Salford; Norman Samuel Wooding, Technical College, Coventry.

Fellowship

Branch E, the Chemistry, including Microscopy, of Food and Drugs and of Water: Arthur Alcock, Richard Arthur Dalley, John Valentine Smart.

Branch G, Industrial Chemistry: with special reference to Petroleum: John Mackay Harkness.

With special reference to Paper Manufacture: Miss Helen Mackay McKenzie, M.A., B.Sc. (Aberdeen).

With special reference to the Paint Industry: James Musgrave, B.Sc. (Dunelm).

Special examination in Pharmaceutical Analysis: William Harold Cullen Shaw.

American Chemical Notebook

From Our New York Correspondent

CHEMICAL engineers lead the entire engineering profession in earning capacity, according to a report by Andrew Fraser, Washington, D.C., consultant, which appears in the current issue of *Chemical and Engineering News*, a publication of the American Chemical Society. A survey of engineering income for 1946 reveals, according to the report, that at all experience levels the composite earnings capacity of chemical engineers "exceeded that of mining-metallurgical engineers, who, in turn, were followed by men engaged in other engineering fields, and in mechanical industrial, electrical, and civil engineering."

This earnings advantage of chemical engineers, who last year constituted 10 per cent of the engineering profession in the continental United States, is all the more remarkable, the report states, because chemical engineers are a younger-aged group. "In 1946, their median years of professional experience were only 10 years," the report points out. "This figure contrasts sharply with those of engineers in the other five fields mentioned above, whose median years of professional experience ranged from 13 to 23 years."

* * *

A new water-soluble polymer, known as Amberlite W-1, possessing unusual qualities of uniformity and stability, adhesion, compatability and ability to be insolubilised, was announced this week by the Resinous Products and Chemicals Company. Preliminary tests of the new polymer, company officials said, reveal its value in the manufacture of wet strength paper, adhesives and cements, as a thickener for latex and Neoprene, and indicate potentialities for reproduction operations, printing techniques, sizing and all types of coatings.

* * *

A finish for interior surfaces that will withstand marking by water, heat, alcohol, acids and grease seems a possibility, reports the United States Department of Agriculture, as a result of some recent research at the Eastern Regional Research Laboratory, which has developed a new product known as allyl sucrose from sugar. Such a finish for furniture, wall coverings, interior surfaces and woodwork would be a boon, not only to homes but also to hotels and restaurants. The research done at the Eastern Regional Research Laboratory forms part of a programme of work being done at this and three other regional research laboratories of the Bureau of Agricultural and Industrial Chemistry to find new industrial uses for farm products. It opens a new field of research in the preparation of several somewhat similar derivatives of sucrose.

Two new reparations plant to be put up for sale by the U.S. Government include portions of the Dynamit A.G., Goestacht-Krummel, and equipment from the Paraxol at Lippoldsberg, Germany. It includes units for the production of formaldehyde, pentaerythritol, and plastics. Both plants are reported to be in good condition and of special interest to American manufacturers of synthetic resins.

The Krummel plant, located on the Elbe River about 19 miles south-east of Hamburg, was the original site of the first high-explosive plant built by Alfred Nobel and associates in 1865. The plant was extensively remodelled prior to 1940. The equipment consists of 21 items used in the production of plastics with grinding mills, distilling vats, specially lined tanks for storage purposes, a crusher for artificial resins, and allied facilities.

The parts of the reparations plant at Lippoldsberg offered for purchase include one producing unit for formaldehyde and two units for the production of pentaerythritol together with the electrical generating equipment used with these units. It is known that the material allocated to the United States was only slightly used during the war, because of the lack of material and transportation. The current production of pentaerythritol is approximately 14,000,000 pounds, according to an estimate by the United States Department of Commerce.

* * *

Figures covering August, 1947, production of normal superphosphate fertiliser material, released this week by the Bureau of the Census, U.S. Department of Commerce, reveal that at the end of August stocks on hand totalled 705,855 short tons, approximately 100,000 tons more than at the end of August, 1946. Concentrated superphosphate production in August was below the July output but was more than 2000 tons greater than the August, 1946, figure. Total supply again exceeded 90,000 tons, due to the large amount of stocks on hand at the beginning of the month.

* * *

E.I. Du Pont de Nemours & Co., Inc., was owned by 90,984 different stockholders as at September 30, 1947, a decrease of 554 from the number of holders recorded at the close of the second quarter of 1947, company officials announced this week. There were 73,807 holders of common stock and 23,082 holders of preferred stock as the third quarter ended. These figures include 5905 holders of more than one kind of stock. Of the owners of the company, more than 40,000 stockholders are women.

LUMINESCENT PIGMENTS

High Purity Zinc Sulphide as Base

THE investigators who prepared the BIOS Final Report No. 2, "Luminescent Pigments at I.G. Farbenindustrie, Leverkusen and Riedel de Haen A.G.," which is now issued with the usual warning regarding the possible infringement of existing patent rights, were primarily concerned with inorganic pigments as such and not specially with the luminescent variety. The report will, however, be of interest to British technicians engaged in the manufacture of luminescent materials.

Not only are details given of the manufacture of the various types of pigments and their activators, but interesting physical data are included at the end of the report on the various pigments which have been brought to this country. There appeared initially to be very little difference between the results of comparative experiments with the German and corresponding British products, but the British materials eventually proved to be superior after accelerated weathering tests.

Zinc Base

The basis of the I.G. luminescent materials is the preparation of a zinc sulphide of high purity to which is added, before calcination, controlled amounts of various activators and fluxes. For luminescence in ultra-violet light the activators used by the I.G. are metal filament lamps in conjunction with small amounts of copper chloride or sulphide added to the zinc sulphide. A pigment suitable for the production of a long after-glow, after excitation by sunlight or artificial ultra-violet light, contains a small amount of cobalt as well as copper and zinc sulphide.

Riedel de Haen manufacture various luminescent pigments based on four different types of materials: (a) alkaline earth sulphides, (b) zinc sulphide and zinc cadmium sulphide, (c) zinc silicate, (d) calcium tungstate. Full details of the preparation of each type of pigment are given in the report.

Some general points of interest are as follows: Luminescent pigments based on alkaline earth sulphides are comparatively unimportant because of their poor water resistance. Many of the fluorescent pigments based on zinc sulphide are activated by silver. One interesting feature in connection with the manufacturing equipment is that P.V.C., presumably the unplasticised type, is used in certain sections of the plant to prevent contamination of the pigment with metals which would be likely to interfere with the properties of the final product. Pale linseed oil copal varnish is the most suitable medium for dispersing luminescent pigments.

Of interest is this formula for the preparation of a green luminescent pigment based on zinc sulphide:—

Zinc sulphide, 27 kilos; copper impregnated zinc sulphide, 3 kilos; cadmium sulphide, 0.6 kilos; sodium chloride, 1.5 kilos; sulphur, 1.5 kilos; ammonium chloride, 0.6 kilos; magnesium carbonate, 0.015 kilos.

The mixture is ground for two hours in a porcelain ball-mill and then transferred to a crucible. This is then gently heated for one hour after which the temperature is raised to 1100°C. over a further hour and this temperature maintained for 60 minutes. To prevent blackening, the mass is poured into distilled water and washed free of chloride by suction; 30 kilos of pigment are then added to 600 cc. of sodium silicate (38°-40° Be) diluted with 5 litres of water, the plant for this purpose being lined with P.V.C. Five litres of methanol are then added and after stirring for 15 minutes, the solid is filtered off, dried, and stoved for 2 to 3 hours at 70°C.

PHENOL DISPOSAL

The problem of elimination of corrosive phenol from the waste liquids of chemical plants, which in the past has created a serious problem for sewage disposal plants, may be solved if a new process invented by two New York chemical engineers is successful.

Owing to the strong toxicity of the phenol, even in minute concentrations, sewage plants cannot successfully handle wastes containing this chemical, since it kills the bacteria needed for sludge digestion in sewage disposal operation. For cities obtaining drinking water from such rivers as the Ohio and Mississippi, phenol creates another problem, since in passing through the sewage disposal plants of one city, it may flow, unchanged, down-river to contaminate the drinking water of another city. Chemical plant methods for pre-elimination of this material prior to its discharge into sewage lines are now very expensive.

The two engineers responsible for the new process have now found that phenol can be removed by first adding common salt to the wastes containing the phenol, and then distilling the resultant mixture at high pressures. The phenol is obtained as one of the products of the distillation in concentrations which allow it to be processed into a pure material.

PRINCIPLES OF PRESSURE SPRAY NOZZLES—II

Determinants of Drop Size

by H. L. M. LARCOMBE

MANY of the results of nozzle investigation have considered only water as the fluid being sprayed; but a great many other fluids are sprayed besides. Although the laws are not fully formulated for all the physical conditions of fluids, certain empirical rules can be stated which allow interpolation and calculations based on those obtained from water or other fluids.

For pressure nozzles these are as follows:

a. Drop size is approximately inversely proportional to the square root of pressure.

b. Drop size increases approximately as the square root of the viscosity.

c. Drop size increases approximately to density.

d. Drop size increases approximately to surface tension.

The above rules can be applied also to approximate the size distribution. If liquids of different properties are sprayed the same size distribution will be obtained at different pressures.

Table 1 shows the drop size distribution for three hollow cone nozzles of a similar design to that shown in Fig. 1 (6) and indicates the information which is important in all nozzle specifications but which is unfortunately not always available.

The Falling Drop

In addition to the fact that descending drops do not follow entirely either the gravitional laws or Stokes' Law over the entire descent it is also true that they do not remain truly spherical. An approximation of this effect can be made which has a bearing on the design of absorbtion scrubbers and to a lesser extent on spray drying.

The full study of this deformation is outside the scope of this paper but the following discussion is included to present this fact in its relationship to the nozzle performance proper.

Saito in Japan[7] demonstrated mathematically that, in the case of water droplets falling freely in air, the forces acting on the drops tend to deform them into spheroids oblate normal to the direction of motion. In contrast, it is interesting to note that the theoretical treatment for mercury droplets shows their tendency to prolate spheroids. It has also been shown by Lenard[8] that raindrops, initially spherical, take the shape of inverted cups at velocities of 6 to 8 metres per second, finally bursting into fragments. The disrupting velocity varies from 20 to 10 metres per second for drops from 2.5 to 6 mm. in diameter. Arnold shows that drops falling by gravity reach a terminal velocity much less than that obtained from Stokes' Law when the drop is greater than 2 mm. diameter.

Using the observed terminal velocity for a given size drop, it is possible to calculate the maximum deformation that may occur when there is a flattening normal to the direction of motion. For an example of these calculations reference may be made to Johnstone and Williams[6].

Velocity and Trajectory

These important factors should be considered in two parts: first, the velocity of the droplet issuing from a nozzle with no induced rotation in its flow; and, second, the nozzle which does employ the rotative principle.

The applications which require high velocity jets usually employ the fluid to perform work, *e.g.*, in the descaling of hot steel billets, mould cleaning, or the cleansing of wire screens.

The initial velocity of droplets in a non rotating flow can be assumed for all practical purposes to be equal to the velocity of the fluid stream through the nozzle orifice, which in this type of nozzle runs practically full bore. The velocity will, therefore, be the volume per unit time

TABLE 1

NUMBER OF DROPS IN EACH SIZE GROUP—NOZZLE NO. 2

Nominal Drop dia. in Microns	0.063" dia. Orifice			0.086" dia. Orifice		0.128" dia. Orifice
	50 P.S.I.	100 P.S.I.	200 P.S.I.	100 P.S.I.	200 P.S.I.	200 P.S.I.
10	375	800	1,700	100	300	100
25	200	280	580	60	150	50
50	160	180	260	41	100	45
100	50	60	70	26	34	27
150	27	31	35	14	18	15
200	19	23	27	9	12	11
300	8	9	11	5	8	6
400	2	4	4	4	7	3
500	1	1	—	2	1	2
600	1	—	—	1	—	—

(Water 70° F.)

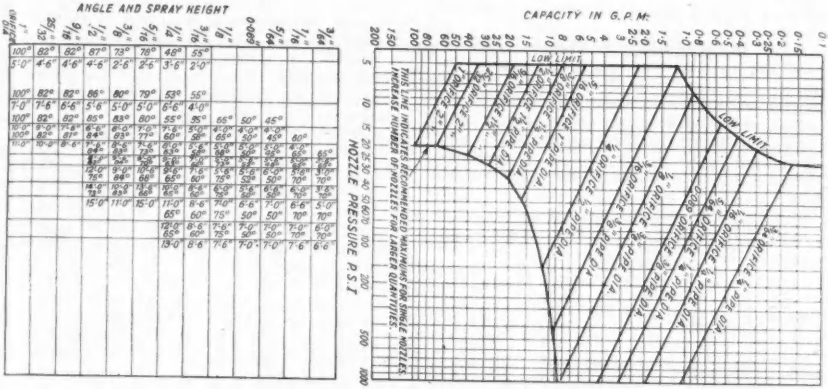

ANGLE AND SPRAY HEIGHT
CAPACITY IN G.P.M.
NOZZLE PRESSURE P.S.I.
LOW LIMIT
THESE LINE INDICATES RECOMMENDED MAXIMUMS FOR SINGLE NOZZLES
THROTTLE NUMBER OF NOZZLES FOR LARGER QUANTITIES

Fig. 4. Performance of nozzle No. 4

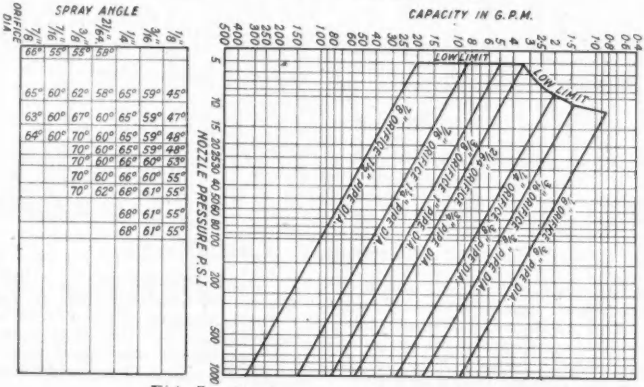


Fig. 5. Performance of nozzle No. 1

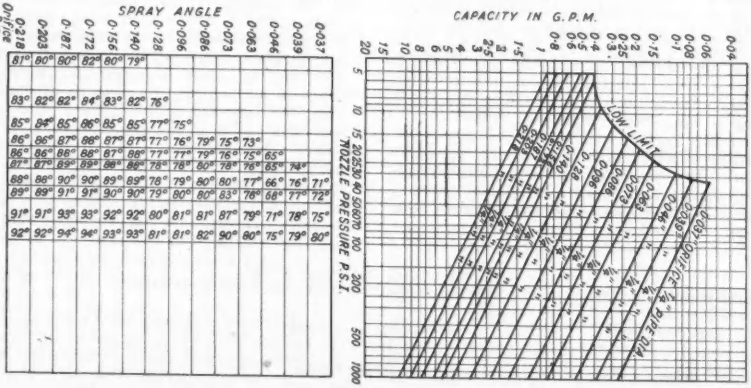


Fig. 6. Performance of nozzle No. 2

divided by the cross sectional area of the nozzle.

With the nozzle with induced rotative flow the problem is not so simple. The initial velocity of the droplet is dependent on the angular velocity of the fluid in the orifice and the axial velocity of the fluid through the orifice. Neither of these quantities is easy to determine, as it is almost certain that the orifice is not running full bore.

For work on droplet trajectory under all practical conditions reference should be made to the work of Lapple and Shepherd[9].

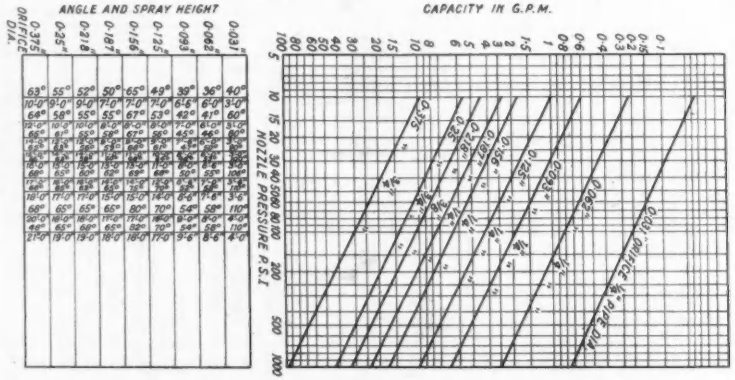


Fig. 7. Performance of nozzle No. 5

For a constant orifice size and similarly dimensioned nozzle, capacity increases with pressure. The relationship between the two factors has been plotted from water capacities actually obtained from various designs of nozzle and has been found to be a Log-Log relationship within a pressure range of approximately 0-1000 lb.

Pipe size to the nozzle has a bearing on the capacity but this is not sufficient to cause any discrepancy if the pipe size is in proportion relative to the nozzle.

Charts have been made of the characteristics of various commercial type nozzles shown in Figs. 4 to 8 and indicating the Log-Log relationship referred to. There is a low limit pressure below which certain nozzles will not operate efficiently, this is shown on the curves in the figures mentioned.

The low limits of pressure shown are for water at room temperature, but for more viscous liquids this pressure must be increased to effect a sufficiently turbulent and unstable jet which will rupture and form into droplets. The question of the pressure required for increased viscosity is discussed later in this paper.

Doble[2] has formulated the equation:

$$\frac{\text{Volume/Unit Time}}{\sqrt{\text{Pressure}}} = K = \text{Constant}$$

The capacity-pressure curves shown in Figs. 4 to 8 have not been found to follow this relationship exactly. The relationship in the above equation is closely followed with some of the nozzles but not so in all of them.

The constant is a function of the proportions and construction of the nozzle and K can be deduced from the curves, if it is required for methods of nozzle comparison.

Doble's formulæ for the predetermination of this constant apply only to one type of nozzle which was tested with water. It is highly probable one of the reasons why the Doble's relationship does not apply in the case of those nozzles shown with a rotating jet is that, for reasons of construction, the internal proportions of the nozzle are not a dimensional function of the orifice. It will be noticed in the vortex type nozzle (Fig. 5) that the value of K is not constant. In Fig. 7 the Doble relationship follows the curves fairly closely in a nozzle design with no induced vortex element in the flow. *(To be continued)*

PERFORMANCE OF NOZZLE NO. 6
Capacities in gallons per hour at pressures up to 100 P.S.I.

Orifice diameter inches	40	50	60	70	80	90	100
.012			.625	.660	.700	.740	.780
.018	1.32	1.47	1.59	1.68	1.78	1.87	1.96
.040	2.2	2.5	2.75	2.95	3.10	3.30	3.40

(Water 70° F.)

Fig. 8

Baird & Tatlock Sales Convention

Instrument Delivery Delays

IN association with Messrs. Hopkin & Williams, Ltd., Messrs. Baird & Tatlock (London), Ltd., held a sales convention on Monday and Tuesday last at the Waldorf Hotel—which was presided over by the company's chairman, Mr. J. E. C. Bailey. Over 50 representatives of the company, together with Press visitors, were present and were welcomed by the chairman.

Sales policy and organisation were dealt with by Mr. Hugh Baird, director, who spoke of the company's intention soon to amalgamate the sales forces into one unit at the Cross Street premises where they would have advice of the technical department readily available to answer clients' inquiries. As part of a general policy of sales expansion, agents were to be appointed for this country on similar terms to those already functioning overseas.

Mr. W. H. Brooker (Baird & Tatlock works manager), who joined the company early this year after a period as works manager for a firm of scientific instrument makers in India, spoke of outstanding "prolific orders." The manufacturing programme, he said, had been drawn up to cover a period to the end of 1948. Orders for some instruments, such as periodic balances, incubators and ovens were at present subject to delivery delays of from twelve months to seven years, but by the end of 1948 this period would in most cases be reduced to one year. Apparatus, such as centrifuges, which required motors, were particularly difficult. Deliveries from the manufacturers came through only in "dribs and drabs." More attention was being paid to design and finish.

Laboratory Fittings

The subject of laboratory fittings was dealt with by Mr. C. L. Prior, who gave the principles to be observed in the efficient layout of laboratories, with particular emphasis upon wastes, fumes and ventilation. In advocating teak for bench tops, he stressed that a plastic material had yet to be produced to surpass teak for all general purposes.

Mr. S. J. Kennedy described the work of the standards department set up in 1941 to issue B.T.L. certificates for all apparatus before sale.

Production at the Ilford factory of Messrs. Hopkin & Williams was outlined by Mr. H. N. Ricketts, works manager. Output of fine chemicals and reagents, he said, had this year generally risen 20-25 per cent over last year, and most orders could be executed within a reasonable period. In some cases (about 15 per cent) there were delays of from two to six months. The main difficulties were now material shortages, a deterioration in quality, shortage of skilled labour, and limitation of space and insufficiency of plant. Production of acetic acid, ammonium acetate, and ammonium and potassium thiocyanate for analytical purposes, together with bromine and bromine compounds were all behind schedule, but the position was improving.

Finally, Mr. J. S. Jackson gave a review of some aspects of oil technology, with particular reference to the oil industry's needs for more and better scientific instruments.

ZIRCONIUM OXIDE

Two German Methods Described

In F.I.A.T. Final Report No. 1048 "Zirconium Oxide Production," issued with the usual warning regarding the possible infringement of existing patent rights, the production of zirconium oxide by two methods used at the factory of Auergesellschaft A.G. at Oranienburg is briefly described. The raw material for these processes, natural zirconia, was originally obtained from Brazil but when supplies became unobtainable owing to war conditions, zirconium silicate was used as a substitute.

After a preliminary grinding of the raw material in a crusher, the small aggregate is transferred to a Raymond type mill where it is ground to a fine mesh size. After this initial processing, the ore is converted to the sulphate ($2ZrO_2.3SO_3$) by treating the ground material with sulphuric acid (66° Baumé) at 180°C. The basic sulphate is leached out by dissolving the mass in water, filtering and crystallising the salt out from the filtrate obtained. After washing, the sulphate is dissolved in water and stored for 3 days at 40°C. At the end of this time the zirconium salt is allowed to settle out and after drying, is calcined at 950-1000°C. to produce the pure oxide.

Zirconium oxide is obtained from zircon sand by first fusing the finely ground ore with caustic soda to give sodium zirconate. This is calcined and then dissolved in water to form oxyhydrates. By treating these oxyhydrates with sulphuric acid the basic sulphate is obtained which is then processed in a similar manner to the product obtained from zirconia.

Personal

MR. F. J. HOUWERT has been appointed a director of Consolidated Tin Smelters, Ltd.

MR. B. G. TWYCROSS has been appointed managing director of Pretoria Portland Cement, Ltd.

MR. R. Y. RULE, a director of Gellatley, Hankey & Co., Sudan shipping agents, has been appointed a director of Sudan Salt, Ltd.

DR. R. L. KAMM has been appointed senior lecturer in physical metallurgy in the University of Melbourne, Australia. He will succeed DR. W. BOAS who recently joined the staff of the Australian Council for Scientific and Industrial Research.

MISS MURIEL ROBERTS, who holds the distinction of being the first woman public analyst in Great Britain—she is superintending analyst for the Liverpool Corporation—is to be appointed assistant City Analyst at a salary of £850 a year, rising to £1000. She has been in the city analyst's department since 1917.

MR. J. S. JACKSON, of the Shell Petroleum and Refining Co., vice-president of the Institute of Petroleum and chairman of its Standardisation Committee, has retired from both these offices upon reaching the retiring age. As a souvenir of his many years of service with the Institute of Petroleum and the Scientific Instrument Manufacturers' Association, Mr. J. E. C. Bailey, chairman of Messrs. Baird & Tatlock, Ltd., recently presented Mr. Jackson with a miniature gold-plated tar viscometer to serve as an ash tray. The new chairman of the Standardisation Committee is MR. E. A. EVANS, chief chemist of Messrs. Wakefields.

Obituary

PROF. JOHN MASSON GULLAND, of Beeston, Nottinghamshire, recently appointed head of the brewing industry's research organisation, lost his life in the L.E.N.R. train disaster near Goswick, Northumberland, on Sunday last. He was appointed to the Jesse Boot Chair of Chemistry at University College, Nottingham, in 1936.

The death has occurred at the age of 63 of MR. JAMES SIM, chief draughtsman of Messrs. G. and J. Weir, Ltd., Holm Foundry, Cathcart, Glasgow. He joined the staff in 1909, and carried out much of the pioneering work in the development of the Weir closed feed system and the Weir regenerative condenser, for which he had many patents to his credit.

Next Week's Events

MONDAY, NOVEMBER 3

Society of Chemical Industry. (London Section). Burlington House, Piccadilly, W.1, 6.30 p.m. W. A. P. Black: "Recent Developments in Seaweed Technology."

TUESDAY, NOVEMBER 4

Society of Chemical Industry. (Chemical Engineering Group). Apartments of the Geological Society, Burlington House, W.1, 5.30 p.m. L. Rotherham: "The Selection of Stainless Steels for the Chemical Engineering Industries."

TUESDAY–WEDNESDAY, NOVEMBER 4–5

The British Ceramic Society. (Refractory Materials Section). Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.1. Autumn Meeting. Tuesday, 9.45 a.m., A. H. B. Cross, and P. F. Young: "The Measurement of Apparent Porosity and Bulk Density," J. Mackenzie: "The Changes occurring in Blast-Furnace Stove Refractories during Service"; J. E. Stanworth: "Cristobalite Inversion in a Glass Stone"; R. W. Grimshaw, A. Westerman and A. L. Roberts: "Thermal Effects Accompanying the Inversions of Silica." Wednesday, 10.0 a.m., W. Davies: "British Resources of Ganister and Silica Rock"; C. H. Bacon: "The Testing of Silica Bricks for Service in Open-Hearth Furnace Roofs."

WEDNESDAY, NOVEMBER 5

Society of Public Analysts. Rooms of the Chemical Society, Burlington House, Piccadilly, W.1, 6 p.m. D. A. Lambie: "The Determination of Arsenic Pentoxide in White Arsenic"; J. B. Rickson: "A Semi-micro Combustion Method for the Determination of Organic Carbon"; F. Goulden: "Some Observations on the Semi-micro Determination of Carbon and Hydrogen by the Sucharda and Bobranski Method, using a Macro-Balance."

Royal Society of Arts. John Adam Street, Adelphi, W.C.2, 2.30 p.m. Opening of the 194th Session. Sir Harry Lindsay: "Cultural Relations within the British Commonwealth."

Institute of Fuel. (London Section). The Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W.1, 2.30 p.m. Mr. Donald Hicks: "The Coal Resources of the Country."

THURSDAY, NOVEMBER 6

The Royal Society. Burlington House, Piccadilly, W.1, 4.30 p.m. A special General Meeting. Dr. H. R. Ricardo: "The Bakerian Lecture."

The Chemical Society. Burlington House, Piccadilly, W.1, 7.30 p.m. F. Challenger and Margaret I. Simpson: "Studies on Biological Methylation. Part XII. A precursor of the dimethyl sulphide evolved by *Polysiphonia fastigiata*, dimethyl-2-carboxy ethylsulphonium hydroxide and its salts"; Mr. Wilson Baker and W. G. Leeds: "Attempts to Prepare New Aromatic Systems. Part I. Cyclo Pentindene, 2- and 3-phenylcylopentanecarboxylic acids, and derived ketones"; Mr. A. Albert: "Acridine Syntheses and Reactions. Part IV. A new synthesis of aminoacridines from formic acid and diary lamines."

Chemical Society. (Bristol Section). Chemical Department of the University, Woodland Road, Bristol, 5.30 p.m. Professor R. D. Haworth: "The Oxidation of Phenols."

Royal Institute of Chemistry. South-West Essex Technical College, Forest Road, Walthamstow, E.17, 7.30 p.m. Scientific Film Display.

Chemical Society. (Nottingham Section). Chemistry Lecture Theatre, University College, Nottingham, 6 p.m. F. S. Spring: "Some Contributions of the Organic Chemist to Biological Science."

SATURDAY, NOVEMBER 8.

Institution of Chemical Engineers. (North-Western Branch). The College of Technology, Manchester, 3 p.m. Mr. A. L. Curtis: "Modern Tar Distillation Plant."

Home News Items

Import-Export Prices.—Wholesale prices of imports as a whole in September were unchanged at the index number of 254 (1938—100) and export prices generally rose two points, to 236.

World Power Conference—1950.—At a recent meeting of the International Executive Council of the World Power Conference at The Hague, it was unanimously decided to accept an invitation from the British National Committee for the Fourth Plenary World Power Conference to be held in London in 1950.

Coal Production Drops.—Total output of coal last week was 3,913,400 tons, 87,000 tons below the 4 million ton level which has been reached in each of the past two weeks. The strike of Scottish miners, which lost 138,530 tons, contributed substantially to the reduction. Absenteeism, however, was down to 9.89 per cent compared with 15.25 per cent a year ago.

Fire at Rubber Dump.—Fire brigades from a number of London boroughs were summoned to a serious fire which broke out at a Ministry of Supply rubber dump at Limmer Wharf, River Road, Barking, on Monday afternoon last. Hundreds of tons of crude rubber are reported to have been destroyed. A nearby petrol storage depot and a paint factory, which at one time were in danger, escaped damage. The fire blazed for nine hours before it was extinguished.

Chemical Lorry Ablaze.—Northwich N.F.S. fought for two hours last week to extinguish a blaze on a lorry owned by Morgan's Transport Co., Manchester. The incident occurred on the Knutsford-Holmes Chapel Road, near Northwich. Fire broke out when the friction of a burst tyre on one of the rear wheels set the woodwork alight. Paper, chemicals, and rubber with which the lorry was loaded, blazed furiously and were completely destroyed. Although the driver escaped from his cabin uninjured, the vehicle was badly damaged.

Ministry of Supply Factory Fire.—Rhyl and Holywell Fire Brigades stood by throughout the night of October 24-25 keeping watch on the fire which destroyed a two-storey workshop at the Ministry of Supply factory at Llanerch-y-mor, near Mostyn. First warning of the outbreak was given by an employee who saw a quantity of magnesium alight. The fire spread rapidly and firemen found a workshop blazing fiercely. They concentrated on preventing the flames reaching a tank containing 5000 gallons of oil only 20 yards away. Damage is estimated at some thousands of pounds.

Non-Ferrous Directorate Moves.—The Non-Ferrous Directorate of the Ministry of Supply has removed to 2 Hyde Park Street, London, W.2; telephone Ambassador 1290.

Unilever Development.—To further their research work on the processing of fruits and vegetables, and the production of animal feeding stuffs, Lever Brothers and Unilever, Ltd., has purchased the Colworth House (Beds.) estate of Lord Melchett.

British Council Scholarship Awards.—The British Council has awarded scholarships for 1947-48 to 256 graduates or others of like status from 62 countries, including the Dominions and Colonies, to enable them to undertake a year's specialist study in the U.K. In addition, 106 British Council scholars have had their scholarships extended for a further year. Of the 362 scholarship-holders, 44 are studying science and technology, which includes such subjects as biochemistry, tanning, aeronautics and aviation.

Urgent Appeal for Scrap.—Because of the dangerously low level of stocks of scrap metal throughout the country, a joint appeal is being sent on behalf of the Iron and Steel Federation, the Joint Iron Council and the National Federation of Scrap Iron, Steel and Metal Merchants, to all large users of metal urgently requesting supplies of steel scrap. Stocks are precariously low and it is emphasised that unless scrap supplies are rapidly increased, the target of 14 million tons of steel in 1948 may not be reached.

Atomic Pictures Banned.—Prohibition of the publication of pictures, taken under official auspices, of British atomic plant in action was the responsibility of the Foreign Secretary (Mr. Ernest Bevin), states the *World's Press News*, quoting the Foreign Office as its authority. Although the Ministry of Supply is responsible for all development of atomic research, publication of facts on the subject is understood to be regulated by a three-year old agreement between this country and the U.S.A.

Winter Coal Supplies Assured.—Distributed coal stocks to public utility undertakings, railways, industry generally, and coal merchants were estimated last week to have reached 14.7 million tons—4 million tons more than at the same time last year. Electricity undertakings everywhere are said to have 40 days' coal reserves (22 last year), gasworks 32 (20), railways 13 (10), and the engineering industry 44 (28). It is assumed, therefore, that there will be no industrial interruptions this winter unless there is a repetition of last winter's Arctic weather.

Overseas News Items

Swedish Wolfram.—Deposits of wolfram ore have been discovered at Norra Karr, Granna, Sweden.

Japanese Rayon Pulp.—Japanese rayon pulp production reached a post-war peak in July of over 8 million lb.—almost double the June figures, while spun rayon yarn production rose to 1.58 million lb.

Moroccan Phosphate Production.—Phosphate production in French Morocco amounted to a monthly average of over 222,800 metric tons for the first half of the current year, as compared with the pre-war monthly average of about 142,000 and 190,300 tons last year.

Finnish Iron-Ore Project.—The Finnish Government is said to be considering a report regarding the exploitation of large-scale iron-ore deposits (of low phosphorus content) at Otamäki in North Finland. Output would run initially at an annual rate of some 250,000 metric tons, and later double that tonnage.

Canada's Rising Chemical Exports.—Canada's exports of chemicals and allied products in the first seven months of this year were valued $50 million, as compared with $38.9 million a year before and only $12 million before the war. Total exports rose from $1251.5 million in 1946 to $1565 million.

New Copper Smelting Plant.—According to a message from Milwaukee, the Allis-Chalmers Manufacturing Company has signed a contract for the construction of a copper-smelting plant at Paipote (Province of Atacama), the total cost of which spread over a period of three years, is estimated at about 6 million U.S. dollars.

Industrialisation of the Philippines.—A comprehensive 15-year plan for the industrialisation of the Philippines includes the erection of two steel mills (one in Manila, the other in Lana), two wood-distillation plants, and one plant each for nitrogen fixation, soda ash and caustic soda, sulphuric acid, copper smelting, and the production of ferro-alloys.

Hungary Increases Aluminium Output.—Most of Hungary's aluminium is produced at Ajka, where there is a foundry (owners—the Hungarian Bauxite Mining Company) which was originally equipped with 144 troughs to produce 800 tons of aluminium. War restrictions made it impossible to use the plant to its full capacity, but by July this year 72 of the troughs were in use again. Only the lack of necessary chemicals for the manufacture of alumina is still keeping production down.

Chilean Minerals.—Mining production in Chile for January-June, 1947, included: Nitrate of soda 795,780 metric tons, copper bars 218,260 tons and coal 1,043,299 tons.

Hungary's 3-Year Chemical Plan.—Budapest reports state that the chemical works in Pet are to be rebuilt according to a three-year plan, and that the nitrogen works will be able to start production of artificial fertilisers in February, 1948.

No Atomic Casualties.—Conclusive proof that radio-active materials can be safely handled is afforded by the record of the atom bomb projects at Hanford, Washington, Oak Ridge and Chicago, where not one case of radiation damage was reported, states Dr. Karl Z. Morgan, of the U.S. atom plant in Tennessee.

Cheaper Synthetic Motor Fuel in U.S.A.—The use of a new catalytic fluidised technique—developed by the U.S. Bureau of Mines for the manufacture of synthetic motor fuel—may lead to a substantial price reduction, thus permitting the product to compete successfully with the natural product.

Mineral Production Mission.—It is reported from Belo Horizonte, Brazil, that a mission from the Rockfeller Organisation (American International Association for Economic Development) is at present in that city studying a plan for economic recovery with the object of promoting an increase in mineral production.

Italian Sulphur Industry's Development.—It is estimated that Italy's sulphur output will aggregate 144,000 tons this year, as compared with 380,000 tons before the war, a decline that is largely attributed to the flooding of many mines during the war, the destruction of equipment, and the shortage of electric power. Although sulphur will presumably again be shipped to a number of Continental and overseas countries, it is doubtful whether the pre-war market will ever be regained because of the present low price of U.S. sulphur.

Restitution to Nazi Victims.—Many exiles from Germany are reported already to have filed claims for restitution of property of which they were dispossessed by the Nazis. This is the subject of a Foreign Office announcement calling attention to a general order issued by the military government in the British occupied zone. This calls on anyone who was dispossessed under duress since January, 1933, to file particulars of his claim to the Landrat of the Kreis or Oberburgermeister of the Stadtkreis in which he resided.

Company News

The nominal capital of **Hazell Chemical Products, Ltd.**, 74 Blackfriars Road, Manchester, 3, has been increased beyond the registered capital of £500, by £4500, in £1 ordinary shares.

The nominal capital of **Pack and Roy, Ltd.**, manufacturers of chemical preparations, etc., 47 Strangeways, Watford, Herts., has been increased beyond the registered capital of £2500, by £2500, in £1 ordinary shares.

The nominal capital of **O. Tobin, Ltd.**, chemists, etc., 50 Paddington Street, London, W.1, has been increased beyond the registered capital of £400, by £1600, in £1 ordinary shares.

The nominal capital of **Overseas Chemical Export Company, Ltd.** (formerly Overseas Chemical Supply Co., Ltd.), Craigs Court House, 25 Whitehall, London, S.W.1, has been increased beyond the registered capital of £1000, by £1000, in £1 shares.

The nominal capital of **Herbert Ferryman, Ltd.**, chemists, etc., Cobden Bridge, Southampton, has been increased beyond the registered capital of £10,500, by £30,000, in £1 5 per cent cumulative non-redeemable pre-preference shares of £1.

New Companies Registered

Lunex (Birmingham), Ltd. (443,680).—Private company. Capital £100 in 100 shares of £1 each. Chemists, chemical plant manufacturers, etc. Directors: R. A. Smith and H. A. Edwards. Registered office: 47 Constitution Hill, Birmingham.

Standard Laboratories, Ltd. (443,154).—Private company. Capital £10,000 in £1 shares 9000 5 per cent redeemable preference and 1000 ordinary). Manufacturers of and dealers in pharmaceutical and chemical products, etc. Subscribers: N. Austin, and F. P. Cadler. Solicitors: Frere Cholmeley & Co., W.C.2.

Bioplastics (Empire), Ltd. (443,785).—Private company. Capital £25,000 in 1s. shares. Producers and manufacturers of and dealers in plastic powders, glass and refractory materials, chemicals, resins, etc. Subscribers: E. W. J. Wood and G. P. J. Francis. Registered office: 88 Kingsway, W.C.2.

Philip A. Godfrey and Company, Ltd. (443,942).—Private company. Capital £2000 in 2000 shares of £1 each. Manufacturers and distributors of and dealers in chemicals, gases, gypsum and acids; manufacturers of and dealers in electrical accumulators, batteries, etc. Directors: P. A. Godfrey and Gertrude Godfrey. Registered office: Chase Street, Wisbech, Cambs.

Scottish Heather, Ltd. (443,833).—Private company. Capital £100 in £1 shares. Exporters, importers and manufacturers of and dealers in chemicals, gases, drugs, medicines, disinfectants, fertilisers, etc. Directors: Capt. J. MacMillan and Mrs. Dorothy E. MacMillan. Secretary: E. S. Webb. Registered office: 86 Blatchington Road, Hove, 3.

Buxton Peat Manattone, Ltd. (443,791).—Private company. Capital £100 in £1 shares. Manufacturers of and wholesale and retail dealers in chemicals, salts, alkalis, drugs, medicines, oils, etc. Directors: M. Samuel, J. Samuel and M. Samuel. Registered office: 44 Brazennose Street, Manchester.

Liquid Heat, Ltd. (443,931).—Private company. Capital £100 in 400 shares of 5s. Manufacturers and distributors of heat exchange liquids of all kinds, designers and manufacturers of and dealers in apparatus and appliances relating to or employing heat exchange media, etc. Directors: Major Wm. E. Langrish-Smith and C. Shaw. Registered office: 103 Cannon Street, E.C.4.

Tolhurst & Neild, Ltd. (444,079).—Private company. Capital £5000 in £1 shares. To acquire the business of thermometer manufacturers now carried on by Bertram Edward and Ernest A. Underhill, at 390 College Road, Kingstanding, Birmingham, as "Tolhurst and Neild." Directors: B. E. Underhill, H. A. Underhill, and E. A. Underhill. Registered office: 390 College Road, Erdington, Birmingham.

Ashill Distributors Company, Ltd. (443,658).—Private company. Capital £5000 in £1 shares. Manufacturers of and dealers in chemical and other fertilisers, insecticides, germicides, disinfectants and spraying machines, dealers in seeds and agricultural tools and requisites, etc. Directors: J. K. M. Broadhead, C. F. Robin, D. H. Sanderson, H. G. Parker, and J. F. Cumming. Registered office: 6 Tombland, Norwich.

Chemical and Allied Stocks and Shares

WITH the City following a waiting attitude pending the White Paper on "cuts" in capital expenditure, stock markets were again very quiet. The New Union Goldfields developments had no marked repercussions outside the mining markets, and industrial shares have been inclined to strengthen, partly owing to estimates of the probable net earnings of leading companies, even if Mr. Dalton were to double the Profits Tax. British Funds turned easier and failed to hold best levels, but were again higher on balance.

Imperial Chemical eased to 46s. 3d. at

which the yield exceeds 4¼ per cent on the basis of last year's 10 per cent total distribution, which the market is assuming is likely to be maintained. Monsanto Chemicals 5s. ordinary, after 57s. 6d., eased to 56s. 3d., B. Laporte were 81s. 3d., and W. J. Bush 85s. In other directions, Major & Co.'s 2s. shares strengthened to 3s. 10½d., while Stevinson Hardy 10s. ordinary have been dealt in up to 21s. 9d. Fisons were 64s. 3d. Glaxo Laboratories 10s. ordinary changed hands around £18¼, a substantially increased dividend being expected; although it is realised in the market that the extent of the increase will depend on whether there is a rise in the Profits Tax, British Drug Houses 5s. ordinary have continued to transfer around 11s. 3d. This is another instance where substantial benefits accrue to the company from the end of E.P.T., but where the scope for improved dividends will turn on the extent Mr. Dalton decides to increase the tax on company profits, Turner & Newall at 71s. 6d. have not held best levels, but British Oxygen strengthened, and General Refractories 10s. ordinary at 21s. have firmed up on current trading reports. Lever & Unilever (51s. 3d.) have been more active, and Metal Box at 97s. 6d. strengthened, attention being drawn to the scope for growth in export business. British Aluminium at 45s. 6d. have been helped by market hopes that the increase already made in the interim payment may be followed by a higher dividend total for the year.

There was better demand for iron and steel shares, the good yields ruling in this section attracting some attention. It is assumed that nationalisation is shelved for a year and that with steel output at a record level and increasing, prospects of dividends being maintained seem good. United Steel were 25s. 4½d., Stewarts & Lloyds 51s., Dorman Long 25s. 6d., while Colvilles at 27s. 4½d. have responded to the second interim payment. A sharp advance in Firth Brown to 61s. 10½d. was attributed to the company's interest in the projected big iron and steel developments in Rhodesia. Elsewhere, textiles turned easier, but British Celanese have been fairly steady around 24s., awaiting the full results. Associated Cement at 59s. 9d., British Plaster Board 23s 9d., and Tunnel Cement 41s. were again easier on the slowing down in housing, but Wall Paper Manufacturers deferred at 42s. 6d. were helped by the higher dividend and results which exceeded general expectations.

Boots Drug at 53s. 9d. eased slightly, Sangers were 30s. Griffiths Hughes 40s. 7½d., and Timothy Whites 42s. Beechams deferred remained around 21s. 9d. still under the influence of the preference share issue news. United Molasses have been steady at 48s. awaiting the interim dividend, and Distillers 4s. units were 28s. Oils turned easier, although Lobitos were better at 65s. 7½d. pending the dividend announcement. Shell went back to 79s. 4½d. awaiting official news of the expected big Royal Dutch issue.

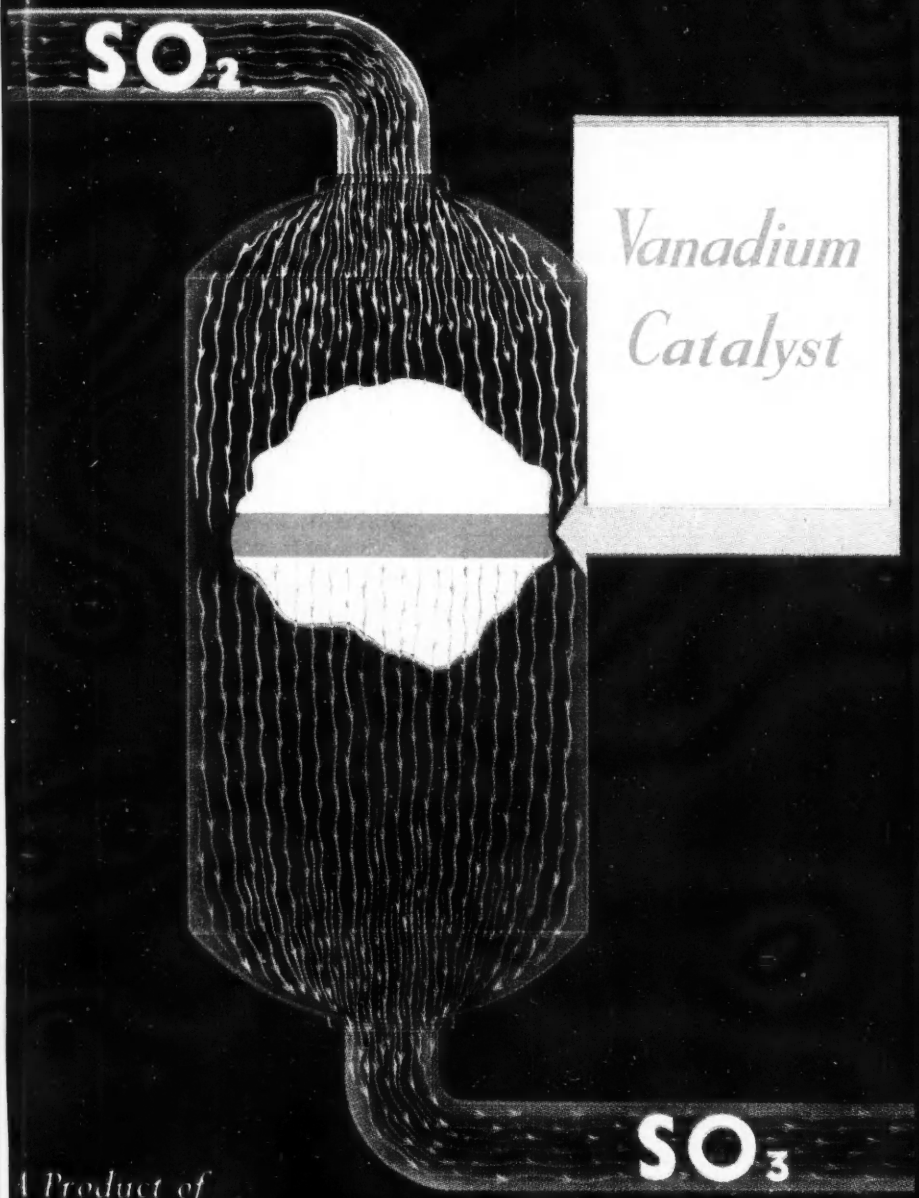
British Chemical Prices

Market Reports

A CONTINUATION of firm price conditions has been reported from nearly all sections of the market and movement, as represented by contract delivery, has been on a fairly substantial scale. Inquiries for new business have been plentiful, although definite bookings for export are difficult, owing to the uncertain supply position. Oxalic, citric and formic acids are firm, with supplies none too easy, whereas tartaric acid is offered for nearby delivery. Soda ash and bicarbonate are scarce, while soda acetate is meeting with a good home demand, although little is available for export. The container difficulty is hampering overseas trade in ammonia liquor, of which there is an ample supply. British formaldehyde is in good demand, with home essential uses absorbing supply. In the coal-tar products market, buyers are finding it difficult to place orders for near delivery and a ready market awaits any parcels that are offered.

MANCHESTER.—Fairly active conditions have been reported on the Manchester chemical market during the past week. Fresh inquiries have been circulating steadily and new home and shipping business has been placed. In addition, there is continued heavy pressure from the textile trade and other leading industrial consumers for deliveries of heavy chemicals already on order, but supply problems in certain of the alkalis and other chemicals remain in evidence. A steady trade in basic slag and other sections of the fertiliser market is reported, and in the tar products market there is a good outlet for most of the light and heavy classes.

GLASGOW.—There has been little unusual activity in the Scottish chemical market during the past week. The demand for solvents of all classes continues, but the supply position remains as heretofore. In the export market, demand has continued heavy, particularly for chemicals for the rubber industry, such as accelerators and anti-oxidants. Orders have been secured for some products, but in many cases it is noted that the U.S.A. are quoting cheaper prices. Orders for dinitrochlorbenzene are being lost because of the great difficulty in shipping this material. Shipping companies have apparently experienced difficulty with previous consignments which they have carried.



A Product of

IMPERIAL SMELTING CORPORATION LTD.

37, Dover Street, London, W.1.

Patents in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of specifications accepted may be obtained from the Patent Office, Southampton Buildings, London, W.C.2., at 1s. each.

Complete Specifications Open to Public Inspection

Manufacture of carbonised fuel.—K. L. Storrs. Jan. 7, 1943. 20398/1947.

Causticising and lime recovery method and apparatus.—Traylor Engineering & Manufacturing Co. Feb. 20, 1946. 1940/1947.

Production of aldol and/or crotonaldehyde.—Usines de Melle. Feb. 18, 1946. 4646/1947.

Manufacture of a new polymerisable compound and polmerisation products therefrom.—Monsanto Chemical Co. Dec. 2, 1943. 23661/1944.

Green pigment compositions.—American Cyanamid Co. March 7, 1946. 952/1947

Methods and apparatus for producing cellulose xanthate.—American Viscose Corporation. Feb. 7, 1946. 21633/1946.

CHEMICAL LEADWORK
TANKS — VATS — COILS — PIPEWORK
W. G. JENKINSON, Ltd. Telephone 22473
156-160, ARUNDEL STREET, SHEFFIELD

ACTIVATED CALCIUM CARBONATE
is a speciality of Derbyshire Stone Ltd., for processes where the utmost dispersibility and miscibility are an advantage.
Enquiries are invited from those interested in the supply of such powders. Samples and full information will be gladly provided. Please state nature of probable application of the powders. Problems investigated without obligation.
DERBYSHIRE STONE LTD
Bank House, Matlock, Derbyshire
'Phone: Matlock 396

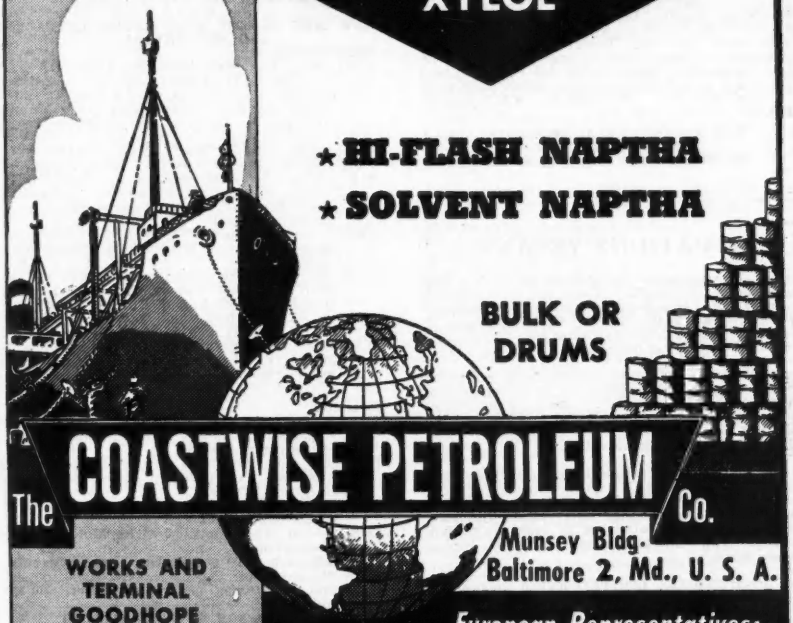
M&B *chemical intermediates*
FOR SYNTHETIC WORK
A selection of M&B *intermediates:* ETHYL BROMIDE, DIMETHYL SULPHATE, ETHYL CHLORACETATE, ALLYLAMINE, 2-AMINOPYRIDINE, SODAMIDE, ACETYL-N-METHYLUREA, HYDROBROMIC ACID.
enquiries to: MAY & BAKER LTD. DAGENHAM
3014

Over 25 Years of Dependable Service!

BENZOL
TOLUOL
XYLOL

★ HI-FLASH NAPTHA
★ SOLVENT NAPTHA

BULK OR DRUMS



The COASTWISE PETROLEUM Co.

Munsey Bldg.
Baltimore 2, Md., U. S. A.

WORKS AND TERMINAL
GOODHOPE
(New Orleans) La., U.S.A.

Enquiries Invited!

SEND FOR SPECIFICATION BOOK

European Representatives:

SIMPSON, SPENCE & YOUNG
28 SAINT MARY AXE.
LONDON, E. C., 3, ENGLAND
Telephone: AVENUE 3921
Telegrams: FALLODEN

EDUCATIONAL

Great Possibilities for
QUALIFIED CHEMICAL ENGINEERS

VAST and far-reaching developments in the range of peacetime productions and markets of the Chemical Industry mean that the profession of Chemical Engineering will be of great importance in the future and one which will offer the ambitious man a career of outstanding interest and high status. The T.I.G.B. offers a first-class training to candidates for the Chemical Engineering profession.

Enrol with the T.I.G.B. for the A.M.I.Chem.E. Examinations in which home-study students of the T.I.G.B. have gained a record total of passes including—

FOUR "MACNAB" PASSES
and
THREE FIRST PLACES

Write to-day for the "Engineers' Guide to Success"—free—containing the world's widest choice of Engineering courses—over 200—the Department of Chemical Technology, including Chemical Engineering Processes, Plant Construction, Works Design and Operation, and Organisation and Management—and which alone gives the Regulations for A.M.I.Chem.E., A.M.I.Mech.E., A.M.I.E.E., C. & G., B.Sc., etc.

THE TECHNOLOGICAL INSTITUTE
OF GREAT BRITAIN
219, Temple Bar House, London, E.C.4

SITUATIONS VACANT

None of the vacancies in these columns relates to a man between the ages of 18 and 50 inclusive, or a woman between the ages of 18 and 40 inclusive, unless he or she is exempted from the provisions of the Control of Engagement Order, or the vacancy is for employment exempted from the provisions of that order.

ANALYTICAL CHEMIST required for works in East London area. Experience in the analysis of non-ferrous metals necessary. B.Sc. or equivalent degree, and age about 30, preferred. Reply Box No. 2546, THE CHEMICAL AGE, 154 Fleet Street, London, E.C.4. Stating approximate salary.

LONDON dyestuff exporters have vacancy for first Assistant to Manager. Must have previous experience, able to work on own initiative and conduct correspondence. Commencing salary £350—with good prospects. Write full particulars in confidence to Box No. 2544, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

PETROCHEMICALS LIMITED invited applications for the positions of Manager and/or Senior Executives for their new plant at Partington, near Manchester. Write, stating age, experience, qualifications, salary required, etc., to PETROCHEMICALS LIMITED, Adelaide House, London Bridge, E.C.4.

PLANT Chemists urgently required for Process Plant Operation by large company operating in the Middle East. Applicants need not be Graduates but should have had a chemical training up to Inter. B.Sc. or National Certificate Standard with experience of shift work in either a gas, coke oven or chemical works. Age not over 30. Salary in sterling between £540 and £600 per annum, plus generous allowances in local currency, with free furnished bachelor accommodation, passages out and home, medical attention, also kit allowance and Provident Fund benefits. Apply, stating age, qualifications and experience, etc., to Dept. F.22, Box No. 2435, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

SMALL firm specialising in aromatic and fine chemical manufacture, require Works Chemist for preparative and experimental work on laboratory scale. Applicants must have good knowledge of organic chemistry. St. Just, Whitefield, Manchester.

SITUATIONS VACANT

TECHNICAL WRITER required at once by leading London advertising agency. Must combine full qualifications in theoretical and practical chemistry with ability to expound technical subjects in graphic, non-technical language. Apply Box No. 2548, THE CHEMICAL AGE, 154 Fleet Street, London, E.C.4.

WORKS CHEMIST required by small firm specialising in aromatic and fine chemical manufacture. Applicants must have experience in semi-scale organic chemical manufacture and organising ability. St. Just, Whitefield, Manchester.

FOR SALE

MORTON, SON & WARD LIMITED
— OFFER —
NEW AND ALMOST NEW HYDRO EXTRACTORS AND SEPARATORS.

Hydro Extractors.

TWO—48 in. all-electric underdriven pitless type machines by BROADBENT, with perforated steel cages of the lift-out type, complete with lifting yoke, electrically interlocking cover arranged sight glasses. Electrical gear suitable for 400/3/50 cycles supply.
ONE—48 in. ditto by MANLOVE ALLIOTT.
TWO—36 in. ditto by THOMAS BROADBENT.
SIX—36 in. all-electric machines by BROADBENT, similar specification to above, but arranged under belt drive from self contained motor and centrifugal clutch.
TWO—36 in. machines by BROADBENT, under belt driven, latest type as above but without driving motors.
ONE—30 in. all-electric overdriven machine by BROADBENT, with self-discharging suspended basket; motor wound 500 V. D.C.
ONE—26 in. under belt driven machine by CHERRY TREE MACHINE CO., galvanised basket.
SIX—Latest type 20 in. underdriven machines by MANLOVE ALLIOTT, with self contained motors, 400/3/50 cycles.

Separators.

THREE—500 g.p.h. size No. 5 all-electric machines by Hopkinson, complete with circulating pumps, electrical gear 400/3/50.
TWO—300 g.p.h. type 4024 Industrial Separators by Alfa Laval, complete with circulating pumps, ell-electric 400/3/50.
TWO—300 g.p.h. units by Hopkinson, size No. 3, similar specification.
THREE—150 g.p.h. units by Hopkinson, similar specification.
TWO—100 g.p.h. units by Alfa Laval, type 3034.
ONE—Sharples Super Centrifuge, type M/34, complete with self driving motor and starter, 400/3/50 cycles.

MORTON, SON & WARD LIMITED
WALK MILL, DOBCROSS,
Nr. OLDHAM.
'Phone — Saddleworth 437.

NEW AND SECONDHAND
CHEMICAL PLANT
Send Your Specific Enquiries To
REED BROTHERS
(ENGINEERING) LIMITED
BEVIS MARKS HOUSE · LONDON, E.C.3.
Telephone AVEnue 1677/8

FOR SALE

TWO 18 in. **CONE MILLS** by E. Boyd, driven through fast and loose pulleys.

One Gardner Rapid **SIFTER & MIXER**, 18 in. × 8 in. × 8 in.

No. 1 **PERIFLO MILL** for wet or dry grinding. Complete with automatic feeding hoppers and stocking discharge filter. Driven through fast and loose pulleys. Output (dry grinding) ½ to 2 cwts. per hr.

Horizontal plate and frame type **FILTER PRESS** by Premier Filter Press Co., twelve timber plates and twelve frames 22 in. square, to form cakes 15½ in. × 14½ in. × 7 in. thick: side feed 1½ in. individual discharge mild steel tie bars, cast iron end frames, hand operated closing mechanism.

One second-hand **MUFFLE FURNACE**, having chamber 24 in. long × 18 in. wide × 12 in. high with vertical sliding door and counter balance weights, gas fired, gas consumption 350 c.f. per hr. maximum. Furnace fitted with Pyrometer reading up to 1200 C.

One unused 4-compartment **ALUMINIUM DRYING CABINET** by J. Glover, fitted with 4 tubular shelves and quick release door catches. Overall dimensions 7ft. 3in. × 3 ft. × 6 ft. with 9 in. sq. ducting top and bottom for inlet and outlet of hot air and vapour.

One steam jacketed **BOILING PAN**, 33 in. dia., 29 in. deep, hand lever operated tilting through trunnion bearings, jacket tested hydraulically to 100 lb. for 50 lb. per sq. inch working pressure.

One Single Roll **EDGE RUNNER MILL**, pan 4 ft. dia × 6½ in. deep, granite roll 3 ft. dia × 9 in. face, fitted with roller and pan scraper blades and underdriven from fast and loose pulleys through bevel wheel and pinion.

One Perplex No. 2 size ball bearing **DISINTEGRATOR** fitted with 1/16 in. mesh screen. Arranged for belt drive from 35 h.p. motor (motor available if required).

GEORGE COHEN SONS & CO. LTD.
SUNBEAM ROAD, N.W.10
and STANNINGLEY, nr. LEEDS.

AUTOCLAVE, vertical, cast steel 39 in. I.D. by 5 ft. 6 in. deep, not jacketed, bolted cover, high pressure, as new £80. THOMPSON & SON (Millwall) Ltd., Cuba Street, Millwall, London, E.14.

CHARCOAL, ANIMAL and VEGETABLE, horticultural, burning, filtering, disinfecting, medicinal, insulating; also lumps ground and granulated; established 1830; contractors to H.M. Government.—THOS. HILL-JONES, LTD., "Invicta" Mills, Bow Common Lane, London, E. Telegrams, "Hill-Jones, Bochurch, London." Telephone: 3285 East.

METAL Powders and Oxides. Dohm Limited, 167 Victoria Street, London. S.W.1.

FOR SALE

WELDED STEEL STORAGE TANKS

PRACTICALLY NEW

TEN.—10 ft. 6 ins. diameter by 6 ft. deep with covers. Capacity, each 3250 gallons.

THREE.—7 ft. diameter by 5 ft. deep with covers. Capacity, each 1250 gallons.

MADEN & McKEE, LTD.,
317, Prescot Road,
Liverpool, 13.

FOR SALE

FLUORSPAR. Overseas shippers through London representatives anxious contact U.K. importers. Three grades F_2Ca available, highest qualities, substantial tonnage. Apply Box No. 2549, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

NEW Stainless Steel Vertical Cylindrical Tanks, 25, 50 and 100 gallon capacity, either with handles, or mounted in rubber castored cradle.
Also Stainless Steel Water-jacketed Pans with similar capacity, arranged for heating by water, oil, gas, electricity or steam.
Also Mild Steel Jacketed Pans for 50 lb. and 80 lb. working pressure, 20/300 gallons capacity.
DELIVERY from stock.
Wanted to purchase second-hand chemical plant—best prices given.

THE MANICRAFT ENGINEERING COMPANY LIMITED
Pryme Street Mills, off Chester Road, Hulme, Manchester, 15.

Phone: 98 Staines

STEAM JACKETED Autoclave 43 in. by 17 in. dia.
Jacketed Vacuum Mixer 19 in. by 19 in. by 16 in. deep.
Jacketed Steel Tank 5 ft. by 4 ft. by 4 ft.
500 ft. of 14 in. and 18 in. Roller Conveyor.
26 in. Belt Driven Hydro Extractor.
16—Glazed Earthenware Containers. 13 in. dia. by 17 in. deep.

HARRY H. GARDAM & CO., LTD.
STAINES.

2 Vertical Stearine Presses.
1 Hydraulic Baling Press.
1 Shirtliffe Baling Press.
42 in. Under-driven Hydro.
Jacketed Mixing Pan, 7 ft. dia., 9 ft. deep.
7 various Filter Presses.
12 Vertical Weir & Hall Steam Pumps.
Several small Steam-jacketed Copper Pans.
Several Ball Mills, 6 ft. 6 in. by 6 ft. 8 in., Silex-lined batch type, with driving gear and clutch.
Two set 2-pair high Breaking Rolls, 33 in. long.
One 18-in. 4-roll Cake Cracking Mill.
One 36-in. dia. Swan Neck Hydro Extractor.
Five Large Filter Presses.
Rectangular Storage Tank, 128-tons capacity.
Ditto, 108-tons capacity.
Ditto, 62-tons capacity.
Sectional ditto, 16-tons capacity.
3 Johnson Horizontal Oil Filter.
Presses fitted 24 plates 36" diameter.
1 Ditto fitted 24 plates 36" square.
Six Simon type Portable Slat Conveyors, 20 ft. long, for boxes or bags.
Three Circular Filter Presses fitted 24 plates 36 in. dia.
Lacey-Hulbert Motorised Compressor, capacity 4 cu. ft., 2,000 lb. pressure.
Mixing Pan, 6 ft. diameter by 5 ft. deep, flat bottom, open top.
Ditto, 3 ft. diameter by 5 ft. deep, flat bottom, open top.
No. 3 Miracle Mill, "Super" Hammers, no Cyclone.
2 Cyclone Collectors, 8 ft. 3 in. diameter, 15 ft. deep, 12-in. bottom outlets.
2—6-in. Centrifugal Pumps by Cherry.
Enclosed Drum Mixer, 8 ft. long, 5 ft. diameter, welded construction, copper lined.

Write: RICHARD SIZER LIMITED, ENGINEERS, CUBER WORKS, HULL

CHEMICAL LEAD BURNING LEAD-LINED TANKS, ETC.

IMMEDIATE SERVICE OFFERED

H. G. FOWLER & Co. Phone CLE 5609
2 Newcastle Row, Clerkenwell, LONDON, E.C.1

FOR SALE

SALE—Contents of modern oil mill, including: 16 Anglo-American Hydraulic Presses by Greenwood & Batley, 16 in. rams and 15 rolled steel plates; two steam-jacketed Double Cooking Kettles; two automatic Cake Moulding Machines; a set of high and low pressure Hydraulic Accumulators; three sets vertical 2-throw Hydraulic Pumps; two automatic Cake Paring Tables; ten various Chain and Bucket and Belt and Bucket Elevators; 30-in. 2-pair Cake Cracking Mill; two sets of Kibblers 2-pair high 12 in. rolls; 32 in. square Filter Press by Johnson; 36 in. square Filter Press by Johnson; two Westinghouse 2-phase 200 volt Squirrel Cage Motors, 100 h.p. and 110 h.p., each with Auto Transformer Starters. Very reasonable prices.

RICHARD SIZER, LIMITED, ENGINEERS, CUBER WORKS, HULL.

20 Welded Steel jacketed Pans, 40 gall., tested 100 lb hydraulic pressure on three legs; bottom outlet £20 each. THOMPSON & SON (MILLWALL) LTD., Cuber Street, London, E.14.

1000 STRONG NEW WATERPROOF APRONS, To-day's value 5s. each, Clearing at 30s. dozen. Also large quantity Filter Cloths, cheap. Wilsons, Springfield Mills, Preston, Lancs. Phone 2198.

SERVICING

GRINDING, Drying, Screening and Grading of materials undertaken for the trade. Also Suppliers of Ground Silica and Fillers, etc. JAMES KENT, LTD., Millers, Fenton, Staffordshire. Telegrams: Kenmill, Stoke-on-Trent. Telephone: 4253 and 4254, Stoke-on-Trent (2 lines).

GRINDING of every description of chemical and other materials for the trade with improved mills.—THOS. HILL-JONES, LTD., "Invicta" Mills, Bow Common Lane, London, E. Telegrams: "Hill-Jones, Bochurch, London." Telephone: 3285 East.

LONDON FIRM offers complete service packing powders of all descriptions, also liquids and chemicals. Long runs only. Containers and packing cases for home and export, made on premises. Near to docks. Own rail sidings. Box No. 2331, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

PULVERISING and grinding of raw materials.—DOHM LTD., 167, Victoria Street, London, S.W.1

WANTED

SECONDHAND CARDBOARD CARTONS wanted, all sizes, price and details to Box No. 2547, THE CHEMICAL AGE, 154 Fleet Street, London, E.C.4.

SYNTHETIC Resin Kettle or Still in stainless steel, about 5 gallons capacity. Jacketed for 100 P.S.I., steam or electrical heating. Fitted with stirring gear, reflux condenser, and bottom outlet. Suitable pan without condenser or enamel-lined pan will be considered. Box No. 2550, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

WANTED.—Supplies of Nitre Cake in ten-ton lots, Box No. 2126, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

WORKING NOTICE

THE Proprietor of British Patent No. 590714, for "Improvements in and relating to the Production of Barbituric Acid and Substitution Products Thereof," desires to enter into negotiations with a firm or firms for the sale of the patent, or for the grant of licences thereunder. Further particulars may be obtained from MARKS & CLERK, 57 and 58, Lincoln's Inn Fields, London, W.C.2.

SURPLUS
RE-CONDITIONED
CHEMICAL
PLANT &
MACHINERY
for
IMMEDIATE
DELIVERY

State your requirements
to

HODSON
& CO. (MACHINERY) LTD
TOTTINGTON · BURY · LANCS

PHONE: TOTTINGTON
123

AUCTIONEERS, VALUERS, Etc.

EDWARD RUSHTON, SON AND KENYON
(Established 1855).

Auctioneers' Valuers and Fire Loss Assessors of CHEMICAL WORKS, PLANT AND MACHINERY
York House, 12 York Street, Manchester.

Telephone 1937 (2 lines) Central, Manchester.

Specialists in
Carboys, Demijohns, Winchesters
JOHN KILNER & SONS (1927) LTD.
Tel. WAKEFIELD 2042 *Established 1867*

Can We Help You With
STOVE-ENAMELLING

Very large conveyor type plant capable of handling up to 1,000 containers daily, immediate service. Send details of your Stove-Enamelling problems—we can help.

AYGEE LTD. 100 Westminster Bridge Road, S.E.1.
Telephone WATerloo 6314 (6 lines)

SUBASEAL

CLOSURES-STOPPERS
for

CARBOYS
DEMIJOHNS
& WINCHESTER
BOTTLES

WILLIAM FREEMAN & COMPANY LIMITED
SUBASEAL WORKS
PEEL ST., BARNSLEY, YORKS.
Phone: 4081 PBX Grams: SUBASEAL BARNSLEY

CHEMICAL AND GAS ENGINEERING CONTRACTORS
SPECIALISTS IN THE DESIGN AND MANUFACTURE OF COMPLETE PROCESS PLANT & EQUIPMENT FOR—

➡ PRODUCTION, COOLING & PURIFICATION OF INDUSTRIAL GASES WATER GAS, PRODUCER GAS HYDROGEN

➡ CATALYTIC PROCESSING of GASES

➡ REFINING & HYDROGENATION OF OILS & FATS producing— EDIBLE & INDUSTRIAL OILS HARDENED FATS, VEGETABLE GHEE, FATTY ACIDS, GLYCERINE

➡ CALCINATION of LIMESTONE DOLOMITE & MAGNESITE

➡ DUST REMOVAL & RECOVERY

PGC

THE POWER-GAS CORPORATION LTD
STOCKTON-ON-TEES
AND
LONDON, AUSTRALIA, CANADA, INDIA, SOUTH AFRICA

Acid Resisting Vacuum
EJECTORS
Steam or Water operated for all Filtration, Evaporation or Distillation Plants.
Lennox **Foundry Co. Ltd.**
Glenville Grove, London, S.E.8
Specialists in corrosion problems

DECOLORISING
Carbon
All grades for all trades Highest Efficiency Lowest Prices
Granular Carbon for Solvent Recovery
Regeneration of Spent Carbon
Write for samples and quotations.
Tel: Woolwich 1158 (2 lines). Grams: Scofar, Wol, London
FARNELL CARBONS LIMITED
Conduit Road, Plumstead, London, S.E.18

DISCOVERY
Europe's leading science magazine. Scientists writing in non-specialist language describe their work in the various branches of science and technology.
Single copies, 1/6 monthly
Annual subscription, 19/- post free
JARROLD & SONS, Ltd.
EMPIRE PRESS, NORWICH

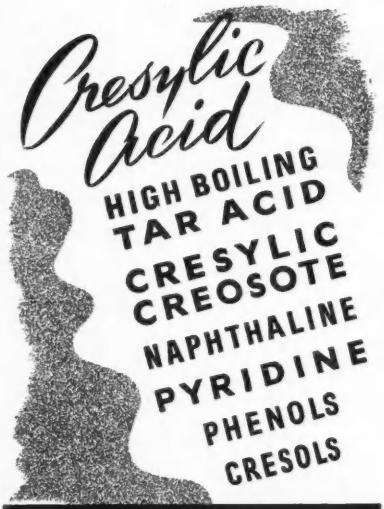
BELTING
AND
ENDLESS VEE ROPES
Superlative Quality
Large Stocks - Prompt Despatch
FRANCIS W. HARRIS & Co. Ltd.
BURSLEM - Stoke-on-Trent
'Phone: Stoke-on-Trent 87181-2
'Grams: Belting, Burslem

STEAM TRAPS
FOR ALL PRESSURES AND DUTIES

WE SPECIALISE
IN ENGINEER'S REQUIREMENTS FOR THE CHEMICAL AND ALLIED TRADES
BRITISH STEAM SPECIALTIES LTD
WHARF ST. LEICESTER
Stocks at: London, Liverpool, Bristol, Whiston, Glasgow, Manchester, & Newcastle-on-Tyne

SWIFT
& COMPANY PTY. LTD.
Specialising in
INDUSTRIAL CHEMICALS, SOLVENTS, PLASTICS AND MATERIALS FOR MANUFACTURING INDUSTRIES THROUGHOUT AUSTRALIA AND NEW ZEALAND
Open to extend connections with
BRITISH MANUFACTURERS
Head Office: 26/30, Clarence St., Sydney N.S.W. and at Melbourne, Adelaide, Perth, Brisbane and Wellington, N.Z.
Cable Address: SWIFT, SYDNEY
Bankers: Bank of New South Wales, Sydney and London.

We are actual producers of
COPPER
ACETATE, ARSENATE, ARSENITE, ACETO-ARSENITE, CARBONATE, CHLORIDE, CYANIDES, OXYCHLORIDE, OXIDES, SULPHATES, and Special
COMPOUNDS
METALLURGICAL CHEMISTS LIMITED
GRESHAM HOUSE, LONDON, E.C.2
Works:
Tower Bridge Chemical Works, London, S.E.1
Talbot Wharf Chemical Works, Port Talbot



MIRVALE CHEMICAL CO. LIMITED
Mirfield, Yorks. Phone Mirfield 2157

CALLOW ROCK
Gas-Burnt
LIME
for all purposes
• • •
QUICKLIME
(*Calcium Oxide*)
of the highest commercial quality, in lumps or in coarse powder form
HYDRATED LIME
(*Calcium Hydroxide*)
in Standard and Superfine grades to meet most industrial requirements
• • •
The Callow Rock Lime Co. Ltd.
CHEDDAR Somerset
Agents: TYPKE & KING, LTD., 12, Laing's Corner, MITCHAM, Surrey

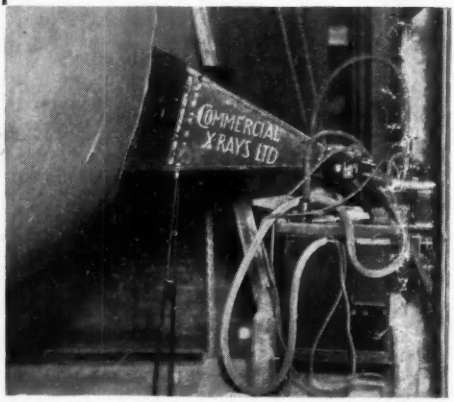
ACID-PROOFING
21 YEARS' SPECIALISATION
A COMPREHENSIVE ORGANISATION FOR ALL TRADES AND INDUSTRIES
FOR
FLOORS - CHANNELS - TANKS (storage and process) - DRAINAGE NEUTRALISING CHIMNEY & TOWER LININGS (chemical)

Head Office & Works:
Wednesbury, Staffs.
Telephone: 0284 (five lines)

PRODORITE LTD.
ESTABLISHED 21 YEARS

London Office:
Artillery House, Artillery Row, S.W.1.
Telephone: 1547-8 Abbey

MOBILE X-RAY SERVICE



for

THE EXAMINATION OF WELDED PRESSURE VESSELS & STRUCTURES ON SITE

APPROVED TEST HOUSE AND MOBILE X-RAY SERVICE FOR LLOYDS; MINISTRY OF SUPPLY; AIR REGISTRATION BOARD, ETC.

COMMERCIAL X-RAYS, LTD. FOUNDRY LANE · SMETHWICK 40
TELEPHONE: SMETHWICK 0846/7 STAFFS. TELEGRAMS: GAMMARAYS, B'HAM.

"STILL LEADING"
For CHEMICAL & ALLIED TRADES

ACID RESISTING CEMENTS & LININGS

For PICKLING TANKS, FLOORS, DIGESTERS, KIERS, STONE, CONCRETE, BRICK, WOOD, IRON VESSELS & ACID TOWERS

PICKLING TANKS 60 FEET LONG WORKING SUCCESSFULLY

AN ALL BRITISH PRODUCT

RIZISTAL

RIZISTAL TRADE MARK

RESISTS
Formaldehyde, Alcohol, Oils, Greases and Tar Acids, Benzene, Toluene Compounds HCl, H_2SO_4, HNO_3, and H_3PO_4, mixed HNO_3 and HF Acids, Aqua Regia, Formic, Acetic, Lactic, Oxalic, Chromic Acids, Bisulphites, Hypochlorites, Mixed Acids, Peroxides, Nascent Halogens and Alkalies.
UNDER STEAM PRESSURES

SOLE MAKER *OVER 50 YEARS' EXPERIENCE*

JOHN L. LORD
WELLINGTON CEMENT WORKS
TELEGRAMS: "CEMENT" PHONE: BURY 617
BURY, LANCASHIRE

Printed in Great Britain by THE PRESS AT COOMBELANDS, Ltd., Addlestone, and published by BENN BROTHERS LTD., at Bouverie House, 154, Fleet Street, E.C.4, 1 November 1947. Registered at the General Post Office. Entered as Second Class Matter at the New York, U.S.A., Post Office.